

JANUARY 1955

chemical processing

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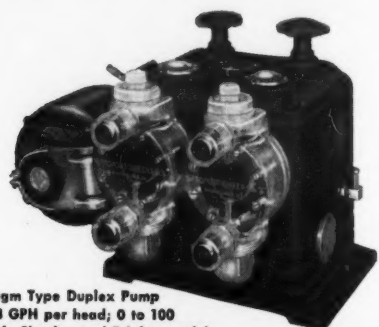
POLYESTER FROM OHIO
Du Pont pushes production at Circleville
as uses expand for Mylar
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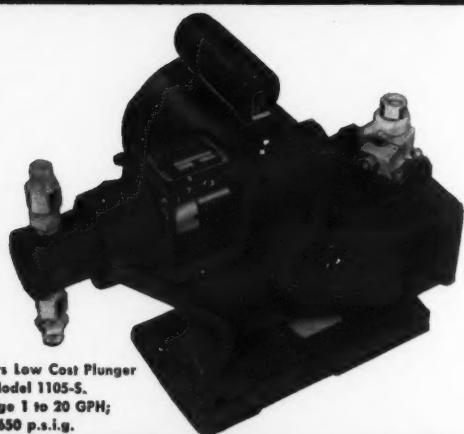
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Cement-coated tablets

Some medicines taken in tablet form are being made with a cement coating so that the tablet must be swallowed rather than chewed. The coating, developed by scientists of Winthrop-Stearns, Inc., Rensselaer, N.Y., withstands pressures up to 33 psi before being crushed. One purpose of the coating is to prevent chewing of tablets of some medicines that may injure the lining of the mouth.

Aluminum rod cuts meat shrinkage

In this column in April we reported that a solid aluminum rod was being marketed as a coffee cooler. Here's a switch: the same material (same form, too) is being offered with a ridged head designed for insertion into meat or fowl during cooking. Idea is to save normal meat shrinkage and cut cooking time by conducting heat to interior of meat. (*The Alcoa News*)

No, thanks

Experiments conducted at GE's Hanford atomic energy plant last year proved that you can swallow a lot more plutonium without being hurt than experts used to think. We'll stick to less potent beverages, thank you. However, the rodents being tested in this important work aid the scientists in finding ways to decontaminate humans who have absorbed radioactive materials.

For more information on product at left, specify CP 4436... see information request blank between pages 2 - 3.

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Key

- ☐ 4436a P
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primary and secondary power 8

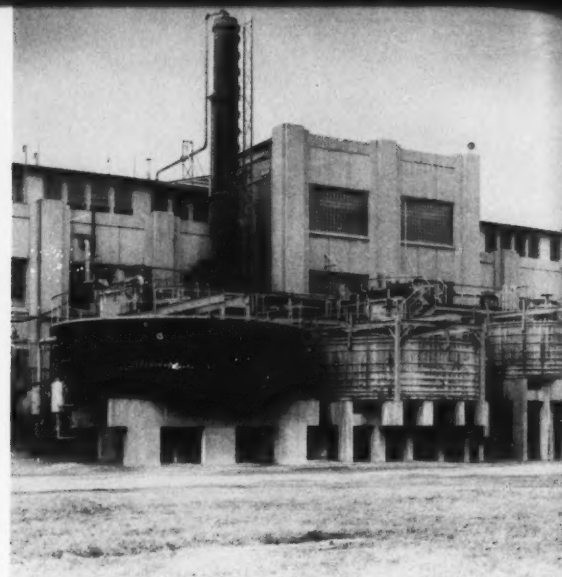
YOU CAN BE **SURE**... IF IT'S

Westinghouse





This plant, producing chlorine, caustic soda and other chemicals, is served from front to back door with a complete Westinghouse power generation, distribution and utilization system. A secondary distribution system of the selective radial type protects this operation against thousand-dollar-a-minute down time.



American Cyanamid engineers and Westinghouse worked out a system that will pay dividends for a long time to come. The answer was in providing a group of power centers that can be quickly and easily expanded into a secondary network system as new buildings planned are put in place. Here's Westinghouse equipment matched with a plan for expansion.

Westinghouse, in cooperation with Intermountain Chemical Co., Westvaco Division, Food Machinery Corp., developed here a complete power distribution system, providing benefits not only of an integrated arrangement, but of one company responsibility for design, manufacture and application of equipment.



YOU CAN BE SURE...IF IT'S

W

Westinghouse can help you match planning with equipment . . .

to bring your distribution system up to par

Early and thorough planning of your power distribution system is the only effective answer to these three basic questions:

1. Will my electrical system be adaptable to changing load conditions with minimum service interruptions?
2. Since down time is very costly, will I get maximum reliability?
3. Can I get good voltage regulation in spite of load fluctuations?

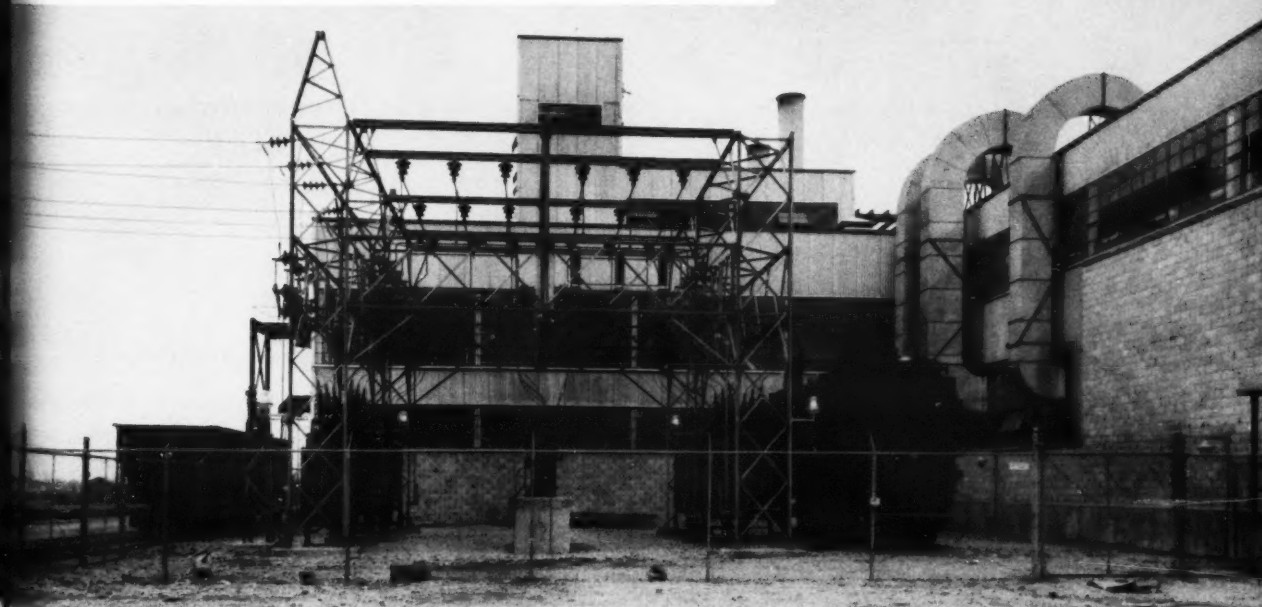
There are many fine electrical systems that can be adapted to fit your process requirements. One modern way to support heavy production schedules is with the network system. This system provides alternate power routes when trouble occurs, so that faults on the line can be shared throughout the system, without down time—a kind of electrical insurance.

But, regardless of the system selected, plan it early, and well, along with process-line planning. Your Westinghouse Representative is ready to assist you. He'll make available to you not only the right equipment, but also the engineering services you need to get started on the right foot.

**These chemical plants integrated secondary power
for more efficient, dependable production**



Outdoor substation by Westinghouse services the entire chemical plant.



Westinghouse

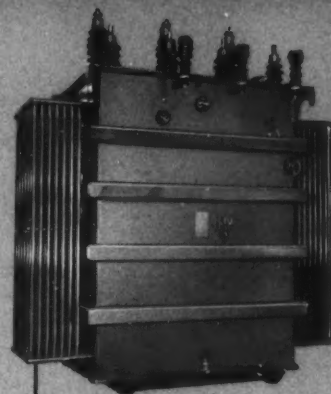


Westinghouse coordinated distribution equipment maintains constant throughput

It's not good business to gamble against power failure when the penalties run high on continuous process lines. And there *are* ways of providing maximum reliability, without stand-by diesel-generator sets or other expensive makeshift arrangements.

This choice of types of equipment and the kind of power distribution layout will depend on the problems in your plant—change-over, expansions, modernization, new processes or products, and so on. Westinghouse can help you select the right equipment and coordinate it to bring out the specific advantages that best suit your requirements.

On these pages are shown several of the major product elements of a typical process power distribution system, and what each can contribute to its over-all effectiveness.

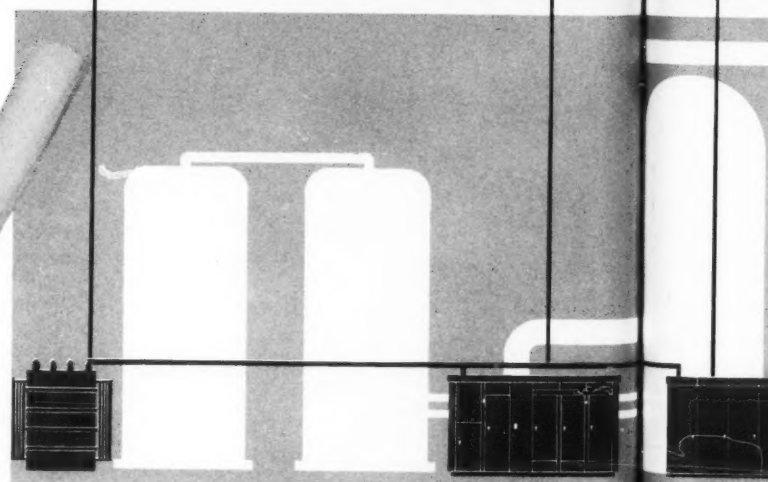
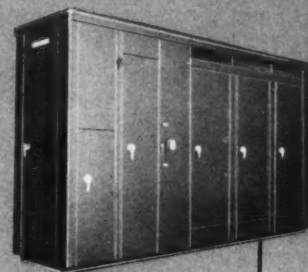


Standardized Type SL Transformers

Liquid-Filled Westinghouse Type SL Distribution or Power transformers for chemical use offer the many economies of standardization, plus design advantages based on years of tested and proved experience.

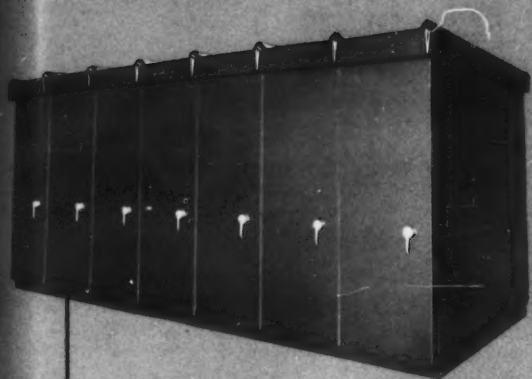
Capacitors

Large Metal Enclosed Westinghouse Capacitor Equipment provides important cost savings, by improving voltage regulation and reducing ampere loading on circuits and transformers. For indoor or outdoor use, these capacitors are rated 230 to 13,800 volts.



YOU CAN BE **SURE**...IF IT'S

Wes



Metal-clad Switchgear

To protect heavy capital investment and prevent costly interruption of chemical processes, switchgear must be exceptionally reliable. Westinghouse Metal-Clad Switchgear more than meets this basic requirement—offers outstanding advantages for chemical service.

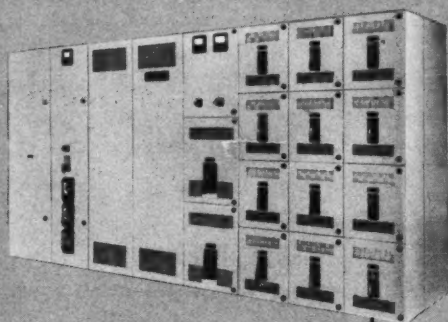
DH Air Circuit Breakers provide positive protection—employ De-ion® arc extinction, the most effective method known. There's less contact burning—less maintenance—more reliability. Breakers draw out horizontally—can be changed in three minutes flat, vital for service continuity.

Corrosion is licked by Bonderizing enclosures *after assembly*—prime and finish painting. For outdoor service, undersurfaces are protected by an all-weather coating.

Standardization in manufacturing keeps your costs down. Special engineering is eliminated. Switchgear can be expanded, re-arranged or relocated with only minor wiring changes and no loss in value.

Dry-type Power Centers

Westinghouse Dry-Type Power Centers include in one line-up an air-cooled power transformer, high and low voltage switchgear equipment—all coordinated and tested at the factory for highest operating efficiency. Since all parts are of Westinghouse manufacture, you receive the plus benefits of unit responsibility.



Bus Duct

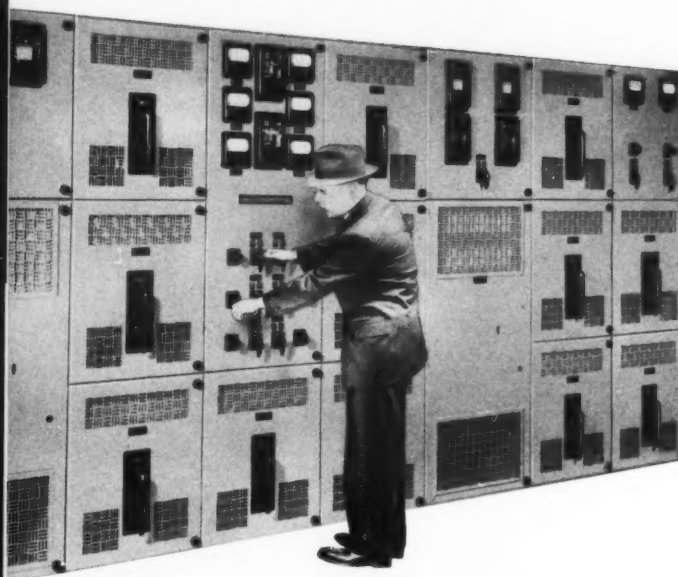
Bus duct is the modern, convenient way of carrying power in both distribution and utilization loads over long or short runs. Four types provide for economical and efficient handling of power under all conditions, indoors and out.

Westinghouse



EQUIPMENT FOR SPECIAL PROCESS
NEEDS ON THE FOLLOWING PAGES.

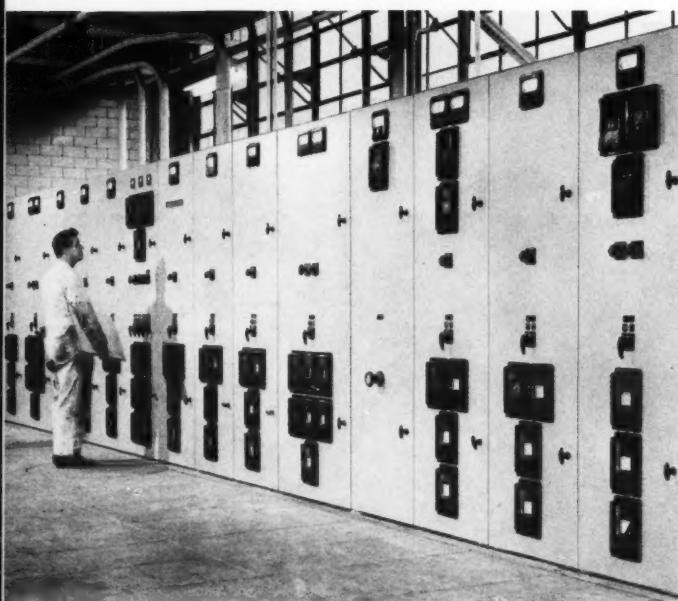
Westinghouse equipment flexibility meets problems of



... special servicing, with Westinghouse Low-Voltage Switchgear

One basic problem is obsolescence, not only of production equipment, but of the arrangement of power serving that equipment. Here are three outstanding advantages of Westinghouse Low-Voltage, Metal-Enclosed Switchgear to help you in this servicing problem.

1. Unitized design eliminates special design and engineering expense for the original installation and, at the same time, provides custom-built preciseness in meeting application requirements — number and rating of breakers; selection of attachments, instruments and relays.
2. With 10 basic units and a selection of standard instrument panels, future additions or replacements can be easily and quickly made any time.
3. All breakers are of drawout type and can be moved from "connected" to "test" or "disconnected" positions, or removed completely.



... special safety requirements, with Westinghouse High-Voltage Switchgear

Westinghouse High-Voltage Switchgear is completely dead-front. All breakers may be closed or tripped without opening doors or otherwise exposing live parts. Each breaker is enclosed in an individual metal compartment. Interlocks are provided so that the compartment door cannot be opened while the circuit breaker is closed. Bare buses, cable connections and instrument transformers are placed in full-height rear compartments and separated from breaker compartments. Interlock and positioning devices assure safe removal or replacement of breakers.

As added protection, Westinghouse Switchgear structures are completely Bonderized after fabrication, inhibiting corrosion and assuring a long-lived finish.

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... especially designed capacity, with Westinghouse Power Centers

Dry-type power centers, capable of being installed in the center of your load area, give you all the advantages of high voltage close to the load. For instance you will gain:

Greater Safety—Because of their inherent design which eliminates the need for oil, Westinghouse Dry-Type Power Centers are safe from explosion. No vaults or safety barriers are necessary.

Lower Line Loss—By installing a Westinghouse Power Center in the center of your load area, you eliminate the need for long secondary lines and their resulting power losses. A loss of only 10% of rated voltage can cut furnace heat generation, for instance, to 81% of normal.

Improved Regulation—Voltage drop on power lines to motors causes low starting torque and increased heating, lessening their efficiency and shortening service life. Westinghouse Dry-Type Power Centers help minimize operating voltage drop and assure good regulation.

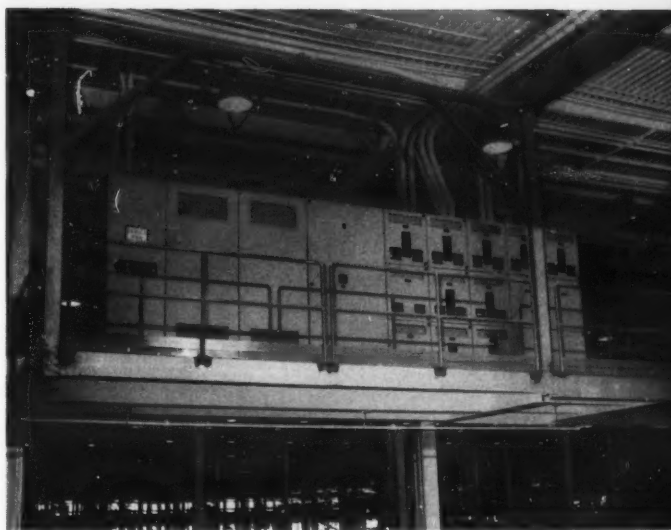
Lower Secondary Cable Costs—Shorter secondary lines mean substantial savings in copper. Realizing these savings throughout an entire plant distribution system can reduce over-all investment considerably.

Power centers include transformer and switchgear in one compact structure.

... especially designed spaces, with Westinghouse Bus Duct and Dry-Type Transformers

Westinghouse Bus Duct is an ideal power distribution medium, because of its universal flexibility. It can be installed quickly and easily to suit physical space needs of your plant. Duct is available in 10-foot prefabricated sections with elbows, tees and crossovers, so that the line can be run in any direction, around obstructions and corners. It can be placed flat or endwise, in batteries or singly, against ceilings or walls, parallel with air-conditioning duct or other lines—and with complete safety. Tight layouts and obstacles are no problem.

In modernization or conversion work, duct is fully salvageable. It can be dismantled, reassembled, expanded—no expensive altering or moving of structures and equipment often necessary with con-



duit-cable systems. Specify flexible Westinghouse Bus Duct.

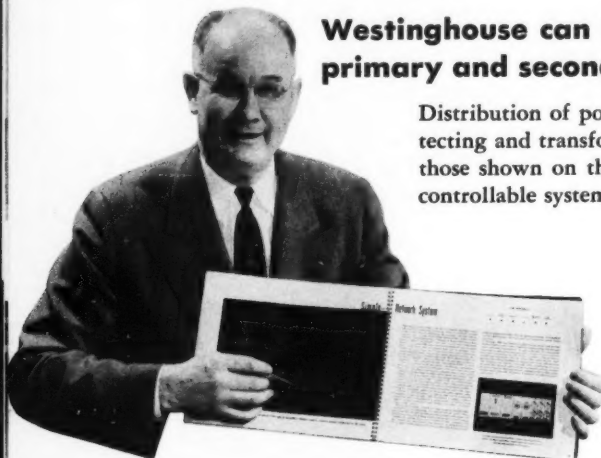
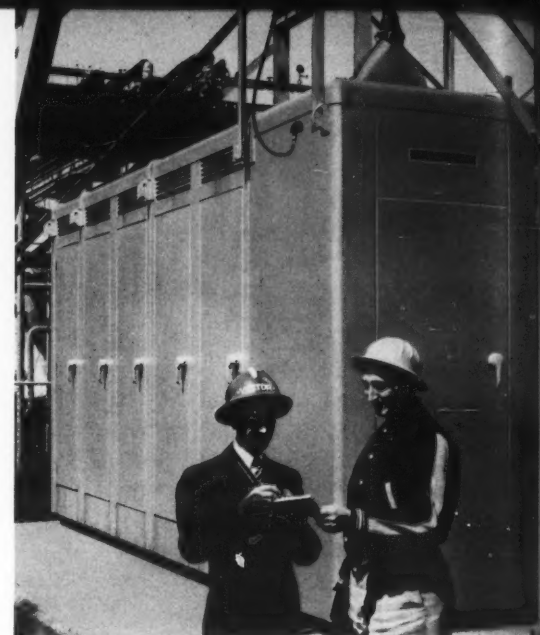
In the picture above, underneath the bus duct, is a Westinghouse AVR B Dry-Type Transformer. Placed strategically throughout a plant, these transformers bring power conveniently, economically close to the load. Basically simple, dry types contain no liquids to change and are therefore easy to maintain, safe from explosion.

Large metal-enclosed capacitor equipments control voltage levels

Today, in many chemical plants, large amounts of kilovars are needed to provide voltages at levels required for efficient operation of process equipment and maintenance of product quality.

Westinghouse Inerteen® Capacitors are the ideal source of these kilovars. Capacitors are low in initial cost, require less maintenance than other methods and save additional investment in transformer capacity.

For these applications, Westinghouse offers metal-enclosed capacitor equipments—capacitors, fuses, busbars, connections, switches and accessories enclosed in safe, weatherproof, metal housings. Averaging less than \$8.00 per kvar, these units are standardized in design and factory assembled—save engineering and installation expenses.



Westinghouse can help you match up primary and secondary power

Distribution of power includes carrying, controlling, regulating, measuring, protecting and transforming electrical energy. Many pieces of equipment, other than those shown on these pages, must be considered in planning a flexible, reliable, controllable system. Your Westinghouse Representative can help you select them, coordinate them and tie them in with your primary power.

When you are planning on building, expanding or modernizing, call your local Westinghouse Office. We can offer you a complete line of electrical equipment, specifically designed for processing plants.

MP-3009

Mr. Perry Croco, Consulting & Application Manager, Central Region, Westinghouse Electric Corporation.

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When repairs are needed, they can be made quickly and properly in any of 38 well-equipped apparatus Repair Shops spotted across the nation. Engineers, operating out of 56 Field Offices, are always ready to provide periodic inspections.

Fast delivery of genuine Westinghouse Renewal Parts from stock in 31 locations enables you to keep low parts inventories at your plant.

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| <input type="checkbox"/> Power Centers B-4162 | <input type="checkbox"/> Capacitors B-3966A |
| <input type="checkbox"/> Transformers That Cut Distribution Cost B-4249A | <input type="checkbox"/> Bus Duct Manual B-4272B |

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(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 January, 1955 No. 1

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Preferred for Dependable Corrosion Service

The Welding Fittings organization — recognizing the superiority of welded piping for corrosion service — was the first to standardize, manufacture, and stock a complete line of stainless steel welding fittings.

The tee shown above—typical of all FLOWLINE Welding Fittings—provides unique features that have been developed through long, intensive specialization in design and production of welding fittings for corrosion service.

FLOWLINE fittings—tees, elbows, reducers, stub ends, and caps—are available in sizes 1/2" through 12", in Schedules 5S, 10S, 40S, and 80S.

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Features of FLOWLINE Tees

- Cold formed — seamless — by the exclusive Welding Fittings process.
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- Heat number permanently stamped on each tee as record of actual analysis and physical properties.
- Every tee is marked with type of metal, size, schedule, wall thickness, and FLOWLINE trade mark.

When inquiring check CP 4437 on handy form, pgs. 2-3



Over
the editor's
shoulder

Automation — whoa!

Automatic (closed loop?) pin-spotting machines for bowling alleys rated a short article in a technical periodical lately. This latest Advance Of Science probably has a place in our Continuing Progress—but it does serve to point up how far afield Automation can get from practical chemical processing.

Actually, spotting pins or boring engine blocks under automatic control is a clever (and probably profitable) engineering achievement. It is the sort of thing that chemical plants have been developing for more than two decades. Before Automation took the spotlight this field of development was called "the continuous process" in chemical circles.

Not that chemical plants have nothing to learn about automatic control . . . or Automation, if you will. Lots of our present plants and processes will be obsolete in X years. And new controls and new control ideas will contribute heavily to bettering today's process standards. Then as now, however, the men who lick these process problems will be working with a process to be controlled, not abstract feedback and frequency response in a rarefied atmosphere of Automation.

Editors of CHEMICAL PROCESSING are certainly not "anti-Automation" . . . but they do feel that Automation applied to chemical processing is simply a new word for what has been happening right along. CP's continuing coverage of such developments (see page 76, this issue) witness this fact.

Bruce Fader

ASSOCIATE EDITOR

THIS MONTH'S COVER

Five-story chemical building of open construction, part of du Pont's new Circleville plant, operates around the clock to produce polymer from which Mylar polyester film is made in another part of plant. Starting commercial production in the early fall of 1954, this plant is also the nucleus for experimental work aimed at finding new and varied uses for the film, some of which are discussed in story on page 56.

Highlights in this Issue

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2. If you are looking for information on specific products, use the Product Directory "Quick-locator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references 170

3. If you want to subscribe to this magazine, see reader-qualification form opposite page 3



Jan. 12-15. World Symposium on Applied Solar Energy, sponsored by Stanford Research Institute, Westward Ho Hotel, Phoenix, Arizona.

Jan. 20-21. Joint Meeting, Commercial Chemical Development Association and Chemical Market Research Association, Edgewater Beach Hotel, Chicago, Ill.

Jan. 24-26. Plant Maintenance and Engineering Conference, International Amphitheatre, Chicago, Illinois.

Jan. 24-28. 12th International Heating and Ventilating Exposition, with 61st Annual Meeting of the American Society of Heating and Ventilating Engineers, Commercial Museum and Convention Hall, Philadelphia, Pa.

Jan. 26-28. Symposium on Instrumentation for the Process Industries, Agricultural and Mechanical College of Texas, College Station, Texas.

Jan. 27-28. American Chemical Society, Southeastern Texas Section, Symposium on Hydrocarbon Chemistry, Rice Hotel, Houston, Texas.

Feb. 8-10. The Society of the Plastics Industry, Inc., 10th Annual Reinforced Plastics Division Conference, Hotel Statler, Los Angeles, California.

Feb. 24. Chemical Institute of Canada, Ninth Divisional Conference, Protective Coatings Division, Royal York Hotel, Toronto, Canada. (On Feb. 25, Ritz Carlton Hotel, Montreal).

Mar. 1-3. Western Computer Conference and Exhibit, jointly sponsored by The IRE, AIEE, and ACM, Statler Hotel, Los Angeles, California.

Mar. 20-23. American Institute of Chemical Engineers, Kentucky Hotel, Louisville, Ky.

Mar. 29-Apr. 7. American Chemical Society, 127th meeting, Cincinnati, Ohio.

Apr. 6-10. World Plastics Fair and Trade Exposition, National Guard Armory, Los Angeles, Calif.

Apr. 14-15. Chemical Institute of Canada and National Research Council, Sixth Canadian High Polymer Forum, St. Catharines, Ontario.

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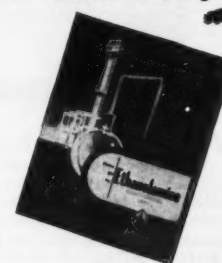
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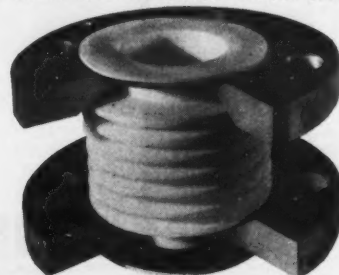
TEFLON* BELLOWS AND TEFLON FLEXIBLE COUPLINGS

• These bellows and flexible couplings are the answer to movement and misalignment in piping carrying a wide range of corrosive commodities.

Dore's quality control assures accurate dimensions, uniform density and wall thickness — rigid testing and inspection guarantees adherence to these controls.

BELLOWS STYLE E-8

Rounded Convolutions • No Corners • Uniform Wall Thickness

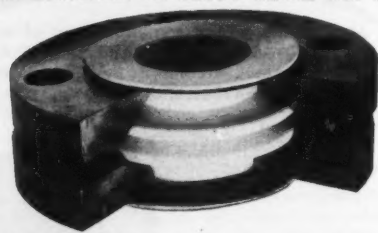


Inert to a wide range of commodities, Dore's Style E-8 TEFLON Bellows are recommended for maximum working pressures of 50 p.s.i. and temperatures of 150° F. They absorb shock, vibration and movement caused by thermal expansion and contraction in piping systems. Style E-8 TEFLON Bellows are furnished with integrally gasketed standard 125-lb. steel flanges. They are available with diameters 1" through 20", in lengths from 1½" to 60".

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STYLE E-8-S

Rounded Convolutions • No Corners • Uniform Wall Thickness



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JAMES I. HARPER
Assistant Director
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Sun Oil Company

Mr. Harper received his degree in chemical engineering from Rensselaer Polytechnic Institute in 1932. After two years of teaching in New York City, he joined the Atlantic Refining Company as an operator in their Philadelphia refinery.

In 1936, he started with Sun Oil Company as a chemical engineer in the Research and Development Department at the Marcus Hook refinery, where he later became head of Process Development. In April, 1953, he was appointed an assistant director of Sun's Research and Development Department at the company's Philadelphia headquarters.

Mr. Harper's associations include memberships in the AIChE and the ACS.



petrochemicals —horizons unlimited

What are petrochemicals? This is a matter of some controversy, but it is generally agreed that petrochemicals are chemicals derived either from crude oil or natural gas. In most cases they are not new chemicals, but established ones whose demand has outrun the original source of supply.

The petrochemical industry was born right after World War I with the synthesis of isopropyl alcohol from propylene. Ethylene started its fabulous career in the early 20's with the manufacture of ethylene glycol and a number of allied products. By the beginning of World War II, about \$350,000,000 had been invested in petrochemicals. Since then the investment has been doubling about every 5 years, so that it is over \$3,000,000,000 now and may be \$8,000,000,000 by 1960.

About 150 companies in the United States are involved in petrochemicals, of which 58 are oil refining companies or their subsidiaries. All told there are almost 300 existing or planned plants in the United States and Canada.

On a pound basis, petrochemicals represent about 26% of all chemicals, and on a dollar basis, about 50%. Petrochemicals in 1955 will require about 15

billion pounds of raw materials — 6.3 billion coming from natural gas and 8.7 from petroleum. These figures represent only about 1% of the yearly output of natural gas and petroleum. In other words, the petroleum industry uses less than 4 days' supply of raw materials to make 25% of the nation's total chemical production, leaving 361 days a year to make gasoline and other petroleum products.

The preceding figures do not include production of 190 million cubic feet of helium, 2 billion pounds of carbon black, and a billion pounds of sulfur produced from petroleum and representing 10% of the total United States' sulfur production.

Where has all this growth gone? It would almost be easier to answer where it has not gone. Petrochemicals have created wholly new industries and jobs, raised our standard of living through better clothing, better household furnishings, better transportation and even better and more abundant food.

Take our clothing, for example. There are 1½ billion pounds of synthetic fibers and 6½ billion pounds of natural fibers used per year. Dacron consumes 30 million pounds of para-xylene. Nylon takes 200 million pounds of benzene, 300 million pounds of

When inquiring check CP 4439 on handy form, pgs. 2-3

cyclohexadiene. 1
huge quantities
for acetone
The growth is
endless.
xylene and
polystyrene
are numerous
the acrylic

Ammonia
growth.
as fertilizer
air and
but most
um re-
year but
10 years

About
duced
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of ethylene
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squeeze
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In the
calcium
ever, a
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a prim-

Propylene
also co-
to pro-
isoprop-
glycol
of pro-
most s-
more t-
alkylat-
further-
newer
have u-
fast.

Butane
manuf-
the bi-
75%
and 40
billion

Petrol-
in the
its ex-

cyclohexane and 50 to 100 million pounds of butadiene. Ethylene and hydrogen cyanide are used in huge quantities for Orlon and Acrilan; acetic acid for acetate rayon.

The growth, uses and kinds of plastics are seemingly endless. The alkyd resins use naphthalene and ortho-xylene plus glycol from ethylene and propylene. The polystyrenes have become a household word and there are numerous others, such as the vinyls, the phenolics, the acrylics and polyethylene.

Ammonia, a true petrochemical, has shown enormous growth. Currently 70% is used directly or indirectly as fertilizer. It is synthesized from nitrogen of the air and hydrogen produced largely from natural gas, but more recently available as a by-product in petroleum refining. Ammonia is now a 3-million-ton-per-year business and is expected to double in the next 10 years.

About 2 billion pounds per year of ethylene is produced from natural and refinery gas and annual production should reach 3 billion pounds within the next 10 years. About 170 million gallons per year of ethyl alcohol, representing two-thirds of the United States' production, is made from ethylene. In the automotive field the permanent anti-freeze, ethylene glycol, and tetraethyl lead are ethylene derived. Polyethylene, best known to the public as squeeze bottles, is expected to be the first plastic that will attain an annual consumption of one billion pounds. The all-important chemical, styrene, is made from ethylene and benzene.

In the past, acetylene has largely been a product of calcium carbide made from limestone and coke. However, acetylene derived from natural gas is a lusty infant and may surpass ethylene one of these days as a primary petrochemical building block.

Propylene, another rapidly growing petrochemical, also comes from natural or refinery gases. It is used to produce nearly one billion pounds per year of isopropyl alcohol, 60 million pounds of propylene glycol and 60 million pounds of glycerin. A polymer of propylene alkylated with benzene is the basis for most synthetic detergents which have now captured more than 50% of the soap market. Propylene is alkylated with benzene to form cumene, which is further reacted to give phenol and acetone. The newer epoxy resins, based on phenol and propylene, have unusual adhesive properties and are growing fast.

Butanes and butylenes are used principally in the manufacture of butadiene, another petrochemical in the billion-pound-per-year-plus category. In 1953, 75% of the United States' production of butadiene and 40% of the styrene went to produce about 1.4 billion pounds of synthetic rubber.

Petroleum-derived aromatics are now a major factor in the chemical market place. Petroleum benzene with its extreme purity is a premium product and now

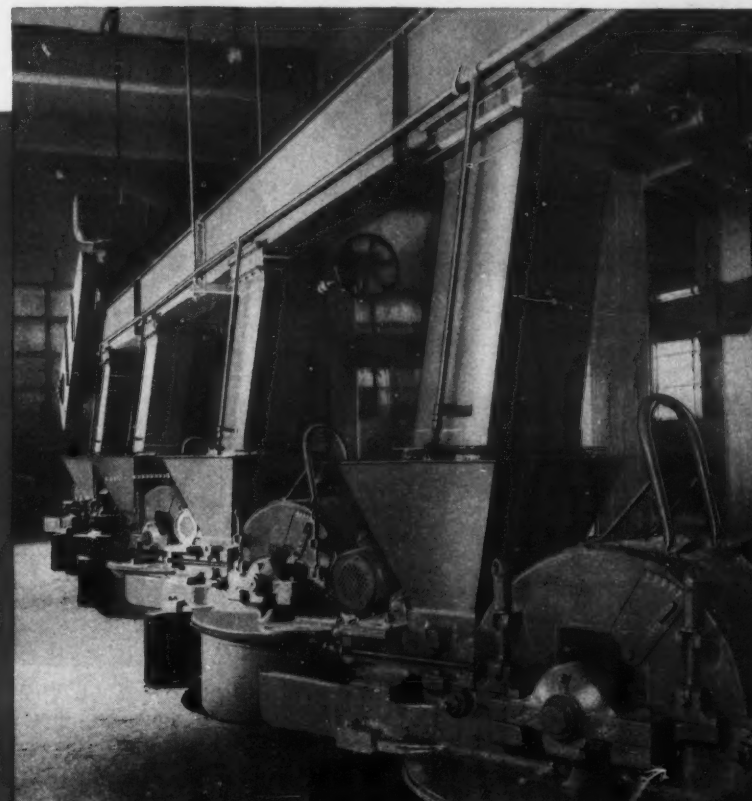
(Continued on page 169)

Viva Mikro-D! It Helped Mexico Make More and Better Tortillas!

New World Way

Section of a battery of MIKRO-D PULVERIZERS grinding tortilla flour in a plant in the suburbs of Mexico City.

(Photo by Mary St. Albans)



Old World Way



There's a revolution going on south of the border . . . a peaceful one . . . and we are proud to have supplied the "heavy munitions".

For centuries the corn meal for tortillas, the substitute for bread in our sister republic, was ground in the village mill or by the housewife with her own crude implements. Today it is mass produced in better quality, and Mexican folks are enjoying the obvious benefits of modern food engineering.

One plant alone in the suburbs of Mexico City is turning out a minimum of 600,000 pounds of corn meal per day by a patented process. And every ounce of it is ground and blended in a battery of 19 MIKRO-D PULVERIZERS.

Through meritorious service such as this, the tradename MIKRO-D has come to stand for a better product, in greater volume, at lower cost, not alone in the food field but in the chemical, drug, cosmetic and allied industries.

Why not let our engineers work on your problem? The facilities of our laboratory are yours to command without charge or obligation

Mikro-D
PULVERIZER

PULVERIZING MACHINERY DIVISION
METALS DISINTEGRATING COMPANY, INC.

60 CHATHAM ROAD

SUMMIT, NEW JERSEY 2019

PULVERIZING • AIR CONVEYING • DUST COLLECTING EQUIPMENT

When inquiring check CP 4440 on handy form, pgs. 2-3



You Can See Why SARAN LINED PIPE CUTS CORROSION COSTS

Corrosion resistant Saran Pipe swaged into steel is your answer to downtime losses.

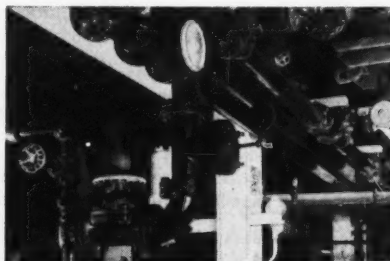
Saran lined pipe, fittings and valves are built to convey acids, alkalis and other corrosive liquids at low over-all costs. The durable inner lining eliminates shutdowns due to corrosion and forms snug, tight-fitting joints that prevent leakage.

Saran lined pipes, fittings, and valves are easily and inexpensively installed. They are cut and threaded in the field with any standard pipe fitter's tools. Because of saran lined pipe's rigidity, even long spans require a minimum of support.

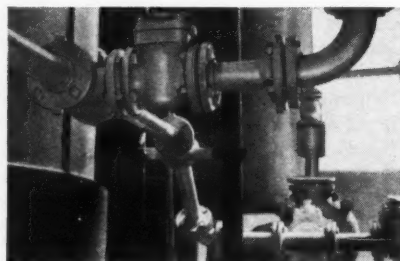
If your operation requires the conveying of corrosive liquids, and if downtime losses are troubling you, investigate saran lined pipe, fittings, and valves today. For further information, contact the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Mich., Dept. 526B.

RELATED SARAN PRODUCTS—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

SOME OF THE MANY
INSTALLATIONS USING
SARAN LINED
STEEL PIPE



A large chemical company uses this installation to convey demineralized water. It has a perfect record of keeping the water free of contamination for five years!



Saran lined pipe used for conveying hydrochloric acid at temperatures from 20° to 90°C., has had no unscheduled interruptions due to corrosion for over two years!

you can depend on **DOW PLASTICS**

DOW

When inquiring check CP 4441 on handy form, pgs. 2-3

*what you can expect in
next month's issue . . .*

Control by radiation aids dry ice process at Brea Chemicals



The view at right, which will appear on next month's cover, shows three scrubbers and absorbers of ammonia plant at Brea Chemicals, Inc., Brea, Calif. By-product carbon dioxide from this step goes to presses that "stamp" it out as blocks of dry ice.

Conventional level control of the CO₂ in these presses caused setbacks because instrument lead lines would sometimes plug with carbon dioxide snow. Automatic control by gamma ray radiation (eliminating pressure taps) has done away with this and other troubles to provide smooth operation of press cycle.

Assistant Operations Superintendent J. W. Buddenberg worked with the CP staff to bring you this "New Solutions" highlight for February.

Indiana Farm Bureau oil refinery solves water pollution problem

Rigid Indiana health regulations posed a waste water problem at the Indiana Farm Bureau's Mt. Vernon oil refinery, where water is dumped into Mill Creek running through the town. Former method (series of baffled catch basins and stepped aeration) left water with a higher oil content than allowed by the Board of Health.

Refinery Superintendent S. E. Jacobsen, with Assistant Editor Ted F. Meinhold, tell how a 400-gpm dissolved-air flotation unit has reduced oil content to conform to Indiana standards in another "New Solutions" feature next month.

Instruments replace "educated fingers" in tannery hotmill control



Associate Editor Fader, a former tannery chemist, made a trip recently to Colonial Tanning in Milwaukee for a story

on complete automatic control of hotmills. The hotmill "automation" replaces the craftsman with "educated fingers" who used to test the process by "feel" of the leather. Bruce, shown above getting the story from Colonial's Saul Levine, reports in detail in the Instrumentation Section feature next month.

Here's a quick preview
of features you'll find
in February's Chemical Processing

Continuous process makes synthetic detergent slurry

Continuous reaction of alkyl benzene and oleum, in a new process, is reported to give a uniform, high-active synthetic detergent slurry, with economic and quality advantages over slurries made by conventional batch methods. On a dry basis, the continuous-process slurry contains 86-88% sodium sulfonates, 12-14% sodium sulfate, less than 1% free oil.

Details of the process are reported in the Ideas section next month.

Lower-cost "squeeze" bottles foreseen

Polyethylene "squeeze" bottles, daily finding new applications in a broad commercial market, may now be produced at lower cost in larger quantities through an extrusion-fabrication process invented in Europe and recently introduced in this country.

New applications and packaging advantages of the economical bottles and tubes are detailed in February's Packaging section highlight.

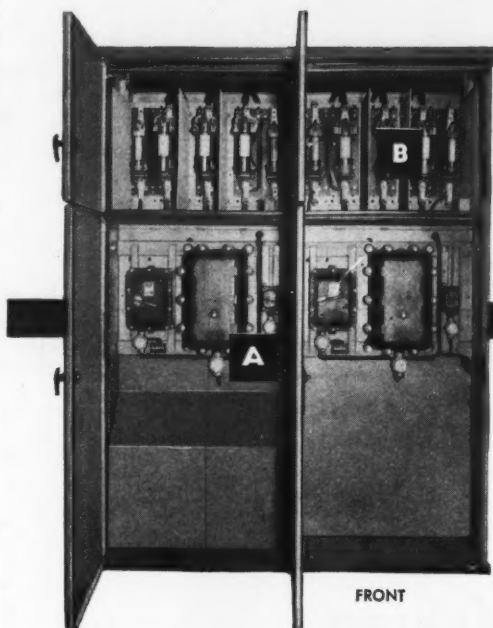
And in brief . . .

February's Guest Editor is Fred C. Abbott of the Pennsylvania Salt Manufacturing Co. Abbott, who is Manager of Industrial Relations at Pennsalt, discusses industrial relations as a major factor in our economic system. . . evaporative cooling with air provides efficient cooling and condensing of organic chemical at the Fords, N.J. plant of Heyden Chemical. The method has minimized need for make-up water, decreased maintenance, resulted in higher heat transfer and close temperature control. Story of recently-installed heat exchangers and condensers is of the Processing section highlights in next month's issue.

How polyvinyl chloride ductwork is successfully venting corrosive vapors above vat dye kettles at American Cyanamid is detailed as one of many articles on corrosion. The ductwork has required no maintenance in more than a year. . .

. . . scores of other articles cover latest developments in Safety, Material Handling, Materials, and all the regular sections.

Engineered for **SAFE** Operation in Semi-Hazardous Locations

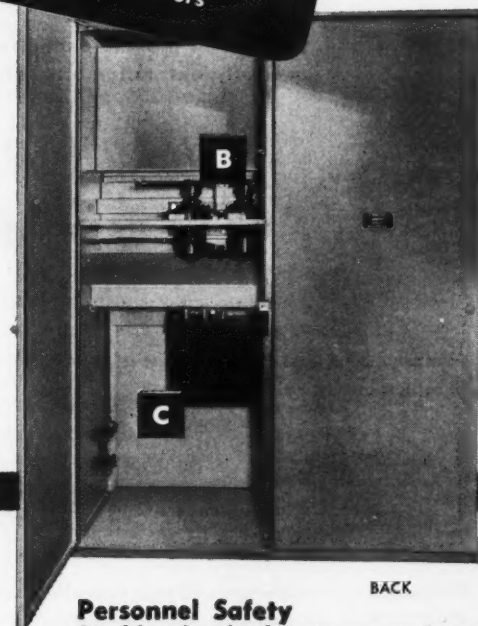


FRONT

Built into every Allis-Chalmers Type H starter is the type and degree of protection dictated by applications. In these particular starters, installed in a semi-hazardous location, all arcing contacts are under oil or in explosion-proof cases.

ALLIS-CHALMERS
TYPE H Starters
for 2300 to 5000
Volt Motors

- A** All overload, undervoltage, timing and auxiliary control relays, as well as other low voltage switching devices, are enclosed in NEMA VII explosion-proof cases.
- B** Fuse disconnects cannot be pulled when carrying current. Fuse compartment door is *key-interlocked* to the control transformer primary oil cutouts.
- C** Main contactor is of the oil-immersed type.



BACK

Type H starters are built in a wide range of ratings for squirrel-cage, wound-rotor and synchronous motors — for full or reduced voltage, reversing or non-reversing — with plugging, dynamic-braking and multi-speed features. A new bulletin, 14B6410B, tells the complete story. See your nearby Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Personnel Safety

Steel barriers in the rear compartment prevent accidental contact with exposed live high voltage parts when operating the oil cutouts or removing the interlock key.

A-4446

ALLIS-CHALMERS



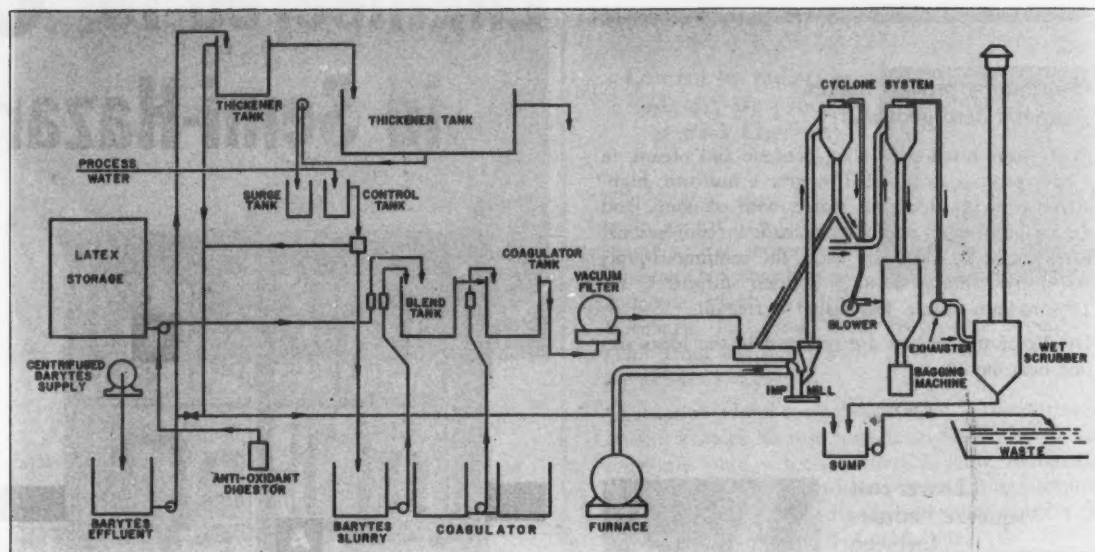
When inquiring check CP 4442 on handy form, pgs. 2-3

new solutions of processing problems

RUBARITE

Rubarite is an asphalt-rubberizing material made by co-precipitation of butadiene-styrene rubber (in latex form) and barytes effluent (see flow diagram). The two materials are treated in such a way that a number of coagulated rubber particles (particle size 1 micron or less) are deposited on a barytes particle (particle size less than 10 microns). These rubber-barytes particles join together to form the end-product, which contains about 50% rubber and 50% barytes (by volume).

When mixed with asphalt or tar, the material is reported to improve flexibility, impact resistance, temperature stability, and aging characteristics. Product has been successfully used in paving compounds, but can also be used in other asphalt compounds. Article below deals with finishing operations (drying, grinding, and cooling) of the manufacturing process.



Process for making asphalt-rubberizing material
uses efficient, automatic mill for . . .

simultaneous drying, pulverizing, classifying

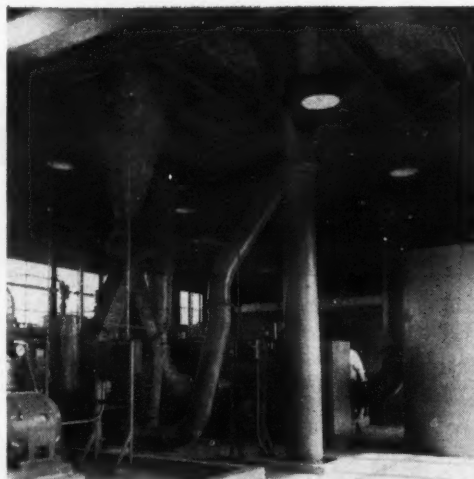
Fineness and moisture content of
product easily controlled

WALTER F. WINTERS, General Manager
Rubarite, Incorporated

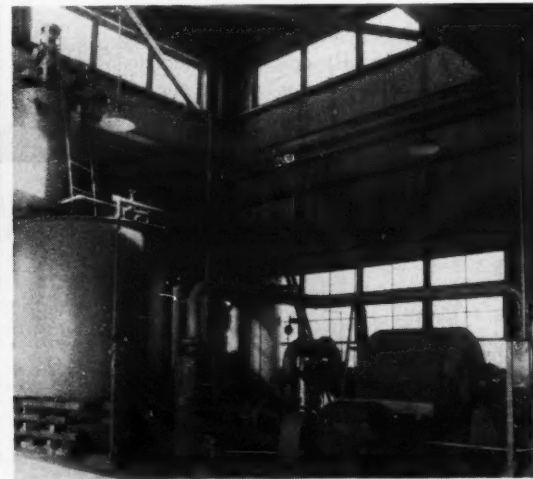
with TED F. MEINHOLD, Assistant Editor

Problem: Inasmuch as drying, grinding, and cooling were particularly delicate operations in their process, engineers at Rubarite, Inc.*, Chicago, Illinois, had to use extreme care in selecting a suitable system for their new Arkansas plant. Company produces Rubarite, a rubberizing material for asphalts.

Final material had to be in such a form that it could be easily added to asphaltic hot mixes, disperse rapidly when incorporated in the bitumens,



Cyclone system cools and collects finished product. Material drops from bin (right) to bagging machine located on floor below



Blending tank (left) and coagulation tank (center) prepare rubber-barytes mixture for vacuum filter (right) in this delicate operation of the process

and retain all of its properties for improving physical characteristics of asphalt and tar.

Solution: When company built the Magnet Cove, Arkansas, plant in 1953, it selected a Raymond whizzer-equipped Imp mill to perform the finishing operations. Cake from the Bird-Young vacuum filter (containing about 40% moisture) is air-conveyed through the unit where it is simultaneously dried, pulverized, and classified.

Heated air (500°F) from a 2.8 million Btu/hr gas

*Jointly owned by The Goodyear Tire and Rubber Company, The National Lead Company, and Bird & Son, Inc.

furnace is introduced directly into return air line of the mill, so that heat must pass through entire length of grinding chamber. Almost all the available heat is used for evaporating water in grinding chamber, and considerably lower temperatures are carried through remainder of system. Turbulent conditions inside mill are ideal for rapid drying.

Mill consists essentially of a swing-hammer rotor turning (1900 rpm) inside a closed housing. Material enters feeder at one end of grinding chamber and is carried through full horizontal length of chamber, passing all hammers before it leaves unit.

From grinding chamber, material is picked up by air stream and carried into whizzer separator. This is integral part of mill but is independently driven by a 3-F Reeves variable-speed transmission (with 1200-rpm 10-hp motor). Revolving blades produce centrifugal action which holds oversize material in mill until it has been reduced to desired fineness. Fine particles pass blades and are cooled and collected in cyclone system. Operation is continuous. Product fineness may be changed by varying speed of blades. Higher speeds result in finer finished products.

Exhauster (driven by 1800-rpm 40-hp motor) supplies necessary air volume for entire system. Moisture-laden air passes through wet scrubber before being vented to atmosphere. Dry product cools to about 100°F and goes to bagging machine whence it is automatically packaged in 50-lb bags. Portion of product is recycled to mill from cyclone system to improve feeding and milling characteristics of the filter cake.

Results: System is entirely automatic and requires practically no attention. Automatic recorder-controllers maintain constant temperatures and compensate for any variation in initial moisture of product.

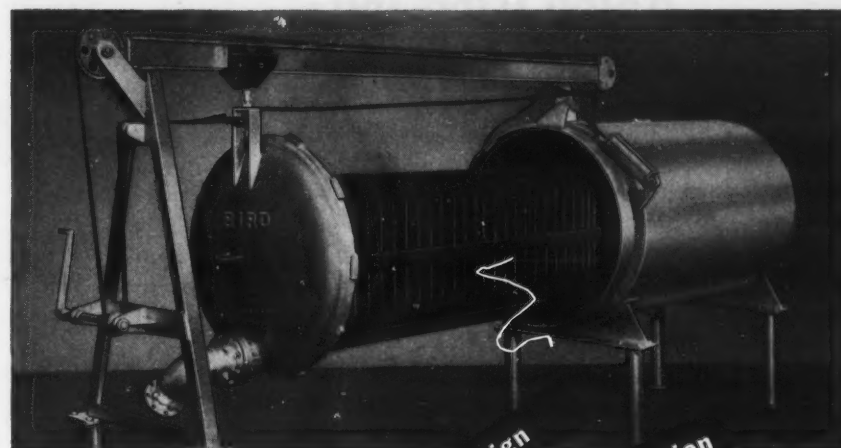
Finished material is about 80 mesh and contains less than 1% moisture. Product can be closely controlled with regard to fineness and moisture. Plant is presently operating at 20 tons per day, but this can be easily increased.

(Mill is product of Raymond Division, Combustion Engineering, Inc., Dept. CP, 1315 North Branch Street, Chicago 22, Illinois . . . or for more information check CP 4443, pages 2 and 3.)

Processing and Engineering Data
begins on page 158

BIRD IS THE WORD...

for the
latest
and
best in



PRESSURE FILTER

design

construction

performance



Bird Pressure Filter leaves are designed and built to take it. No others could stand a test like this.

Compare this newest of Pressure Filters with any earlier models.

Compare it for DESIGN. Advanced leaf design, for example, provides greater strength — larger sustained filtering area — higher rate of flow — faster cleaning, removal and replacement.

A new removable filtrate manifold permits ready rearrangement of the leaf bank and balanced distribution of slurry to leaves.

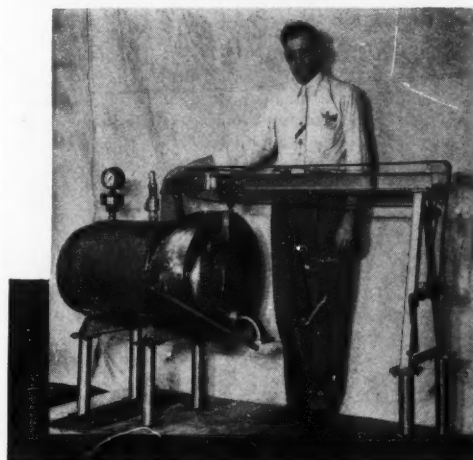
Compare it for CONSTRUCTION. The Bird is built for higher working pressures, hence faster, more thorough filtration. Pressures up to 75 psi are standard — specials up to 250 psi.

The Bird is custom built for the particular application — corrosion resistant alloys or special linings when indicated — insulation or steam jacketing when needed — a great range of sizes to meet almost any volume requirement.

Compare it for PERFORMANCE — Bird can give you the "proof of the pudding" before you commit yourself to an equipment investment. Bird pilot-size Pressure Filters, as pictured, duplicate full scale Filters in every detail. The Bird Research and Development Center provides prompt and reliable test data.

For the last word on Pressure Filter application, get in touch with Bird Machine Company.

Pilot-size Bird Pressure Filter for accurate performance pre-testing.



BIRD MACHINE COMPANY
South Walpole • Massachusetts

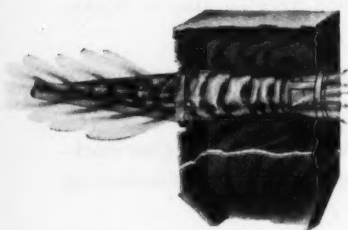
Builders of Bird Continuous Centrifugal Filters and Classifiers, Bird-Young Continuous Vacuum Filters, Bird-Prayon Continuous Rotary, Horizontal Vacuum Filters, and Bird Suspended Centrifugals

When inquiring check CP 4444 on handy form, pgs. 2-3

ANNOUNCING THE NEW AMERclone

AAF INTRODUCES NEW "TWIST"
IN DRY CENTRIFUGAL DESIGN

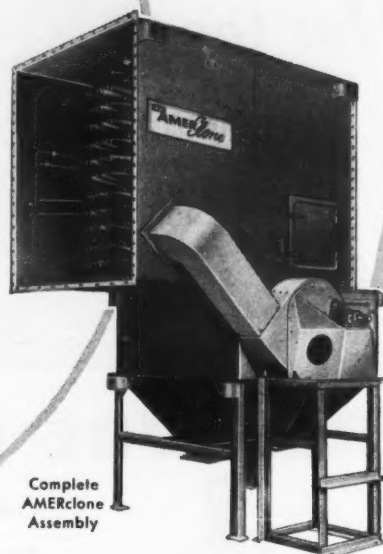
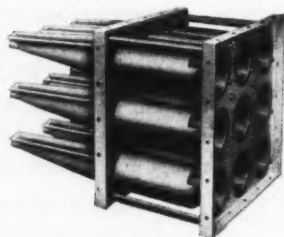
AMERclone Tube



Here's the new "twist" in dry centrifugal design! Only 4" in diameter, the Type G AMERclone tube has an approach velocity of 1000 fpm and a capacity of 333 cfm. Note how clean air travels out through end of tube without changing direction while 10% of air plus collected dust is bled off and thrown into primary dust hopper.

AMERclone Cell

Nine AMERclone tubes are combined to form a single AMERclone cell having a face area of only 20" x 20" and a nominal rating of 3000 cfm. Any number of cells can be used to achieve the desired capacity and they may be assembled to form a unit of a height and width which conform to your space limitations.



Complete
AMERclone
Assembly

AMERclone—another product of AAF research—is designed to handle large exhaust volumes containing dry, granular dust in high concentrations. It introduces many features new to dry centrifugal design which result in the following advantages—

High Collection Efficiency

AMERclone's efficiency is comparable to or better than that of other high efficiency dry-type centrifugal.

Requires Less Space

High approach velocity and single-direction air flow of the AMERclone tube reduces space requirements to as little as one-half that of collector using the conventional reverse air flow principle.

Less Subject to Abrasion

Cast iron tube construction plus elimination of dust re-entrainment assures long life under heavy abrasive service.

Maintains Efficiency

Regardless of variation in primary air volume, AMERclone's maintained secondary air circuit compensates for variation in available centrifugal forces—assures constant collection efficiency over wide operating range.

Write today for Bulletin No. 291 containing complete technical data on the new AMERclone.

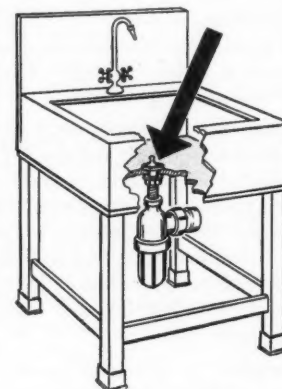
NEW SOLUTIONS of processing problems

**Maintenance, corrosion worries
eliminated by sink drains
made of plastic . . .**

sink traps can be removed and cleaned in few minutes by lab personnel

Problem: When Baxter Laboratories, Inc., manufacturer of intravenous solutions and other pharmaceuticals, decided to expand research laboratory facilities at its Morton Grove, Ill., plant, technicians requested several deep sinks. Company was willing to install these sinks if a compact drain fitting could be obtained for installation in cramped space beneath sinks. Conventional lead or plastic-lined fittings were bulky. As an added problem, lead fittings were corroding on some sinks already in service. Plastic-lined fittings had to be made-to-order by company's maintenance department and were difficult to unplug when drains clogged.

Solution: During January, 1954, engineers decided to install six polyethylene drain units for performance evaluation in the nutritional, organic and bio-chemistry labs. Polyethylene drains were selected because they only extend about 9 inches under sink (including trap). Drains connect to Saran-lined pipes which drain into Duriron underground lines.



Drawing shows method of
installing drain

Traps on polyethylene units may be unscrewed by hand, cleaned, and replaced in matter of few minutes by laboratory personnel.

This feature facilitates removal of any small items (magnetic stirring bars, microscope slides, micro test tubes, etc.) that might drop into drain when strainer is removed.

Units are resistant to mineral acids and alkalis, hydrofluoric acid and other fluorine compounds, mercury, and other corrosive materials. Bacteria do not adhere readily to surface, a consideration in manufacture and testing of medical supplies and pharmaceuticals. High-level drain attachment, strainer, and plug furnished with each drain are also made of polyethylene.

Results: All polyethylene units have been in daily use since the beginning of this year without any maintenance. Highly-corrosive chemicals—even acid cleaning solutions—have been handled by these drains, with no damage. Nuisance of

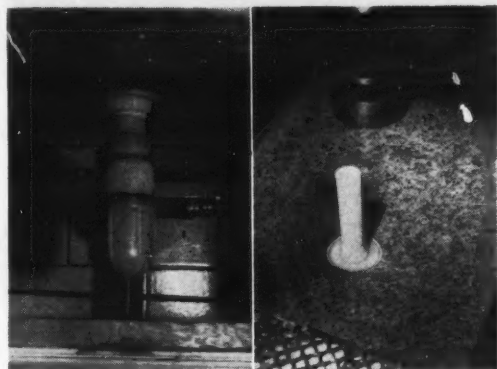


American Air Filter

COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 258 Central Avenue, Louisville 8, Kentucky

When inquiring check CP 4445 on handy form, pgs. 2-3



Compact unit extends only 9" below sink at Baxter Laboratories, Inc. Photo at right shows high-level drain tube in place

clogged drains has been eliminated with a subsequent savings in maintenance man-hours.

(Polyethylene sink units are available from Arthur S. La Pine & Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Illinois . . . or for more information reader may simply check CP 4446 on the convenient Reader Service slip located between pages 2 and 3.)

**Jobs used to take 6-8 hours —
high-speed mills cut time
to 3/4 hour . . .**

capacities range from 20-30 lb ointment per minute; particle size reduced to one micron

Problem: Milling, dispersing, and homogenizing operations required an excessive amount of equipment and time at Parke, Davis and Company's pharmaceutical cream and ointment department, Detroit, Michigan. Considerable handling was involved, and extreme precautions had to be taken to prevent product's contamination. Old paint mills (used for many jobs) were slow and difficult to keep clean — resulting in many man-hours being devoted to cleaning up.

Solution: Company installed several high-speed mills (called Tri-Homo homogenizers-dispersers), which can grind, emulsify, disperse, and homogenize in a single pass. Used with a Moyno pump (or any other pump that will handle viscous material), products are pumped from manufacturing vessels through disperser and into drums. Small units are used for pilot and medium-size production batches and larger machines for barrel-size quantities. Capacity of machine ranges from 20 to 30 pounds per minute.

Feed entering mill is transmitted by a worm impeller to a triple-angle rotor-stator combination. Centrifugal action of rotor forces product between

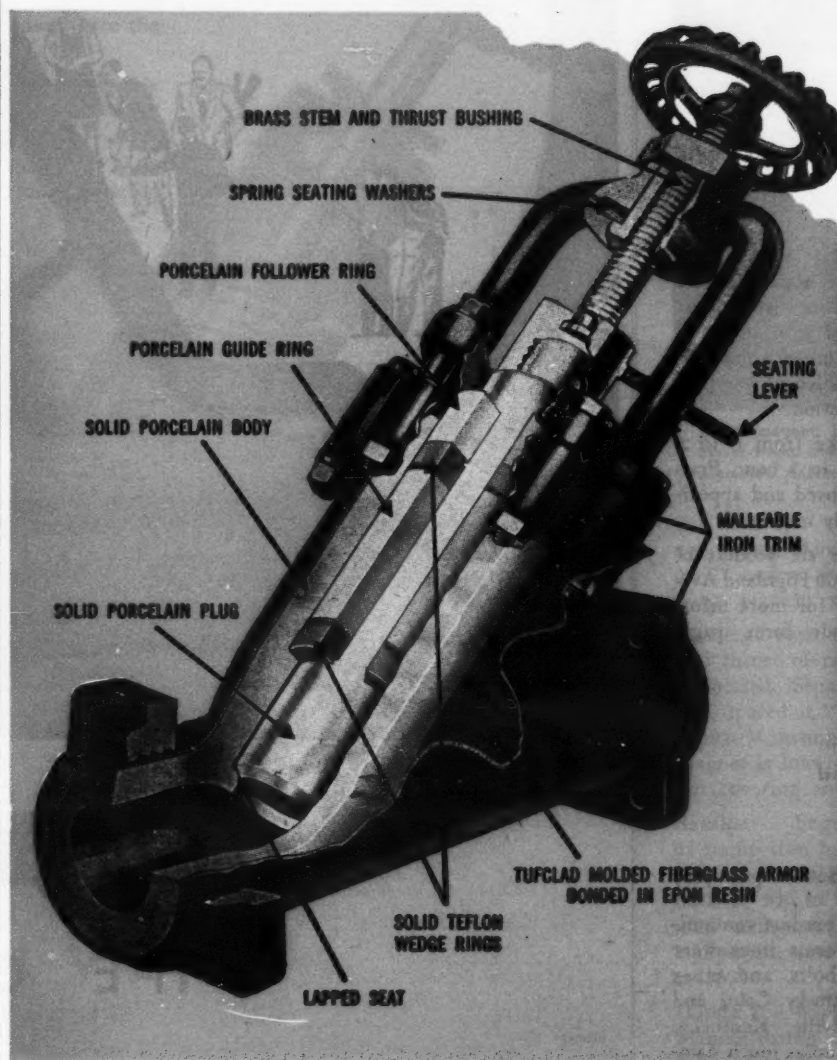
(Continued on next page)

Precision Grinding of Solid Porcelain in the Lapp Valve



The high firing temperature, which assures complete vitrification and zero porosity of Lapp Porcelain, also makes impossible the maintaining of close dimensional tolerances. Necessary tolerances are achieved, however—in regular production $\pm .001$ "—by machine grinding with silicon carbide wheels. In the Lapp Valve, the entire stuffing box chamber, seating area, plug, guide and follower rings are finish ground, for precision assembly and complete interchangeability of parts. In addition, each porcelain plug is individually lapped and polished into its seat integral in the valve body. (No separable seating parts.) Each such valve seal is tested to 150 psi hydrostatic pressure before the valve is shipped.

Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 325 Wendell St., LeRoy, New York.



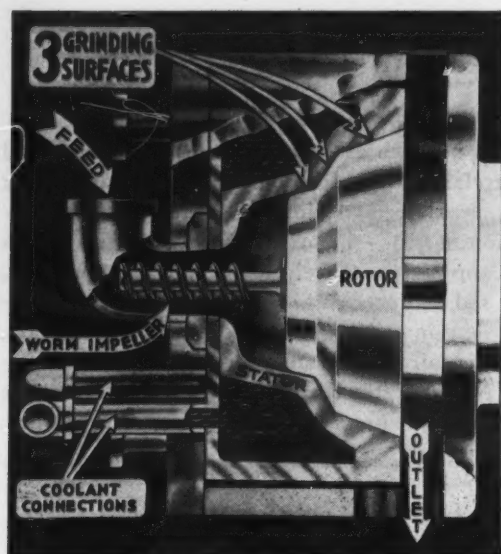
Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment.

Lapp

**PROCESS
EQUIPMENT**

Chemical Porcelain Valves
Pipe • Roschig Rings • Pulsafeeder
Chemical Proportioning Pumps

When inquiring check CP 4447 on handy form, pgs. 2-3



Drawing illustrates operation of high-speed mill

(Continued from preceding page)

rotor-stator faces where material is subjected to hydraulic shear. Liquid phase of slurry becomes homogenized and emulsified, and the agglomerates are reduced to about one-micron particle size.

Small mills have 5-hp motor while larger units have 10-hp motor. Machines are water-jacketed for temperature control. In applications where heat is desirable, units can be operated with steam or hot water in the jacket. Mills are compact, made of stainless steel, and can be disassembled in less than a minute for cleaning and sterilization.

Results: Jobs that used to take from 6 to 8 hours are now accomplished in $\frac{3}{4}$ to 1 hour. Practically all old mills have been removed and appearance of work area has been greatly improved.

(Tri-Homo homogenizers-dispersers are product of Tri-Homo Corporation, Dept. CP, 100 Highland Avenue, Salem, Massachusetts . . . or for more information check CP 4448 on handy form, pages 2 and 3.)

Ferrous contamination removed in pigment plant by grate, hopper magnets . . .

separators save company \$6000 per year

Problem: Machinery damage, product contamination, and fire-breakouts in process lines were being caused by rust particles, bolts, and other forms of tramp iron at the Kentucky Color and Chemical Company, Inc., Louisville, Kentucky. Inasmuch as minute particles can do as much damage as a large bolt in a color pigment plant, it

ANNOUNCING

Another
LUNKENHEIMER
"FIRST"...

NEW



Fig. 2600

LUNKENHEIMER

THE ONE

Great

LUNCOR

Valves and Fittings

The Lunkenheimer PVC Valve resistant to industrial chemicals!

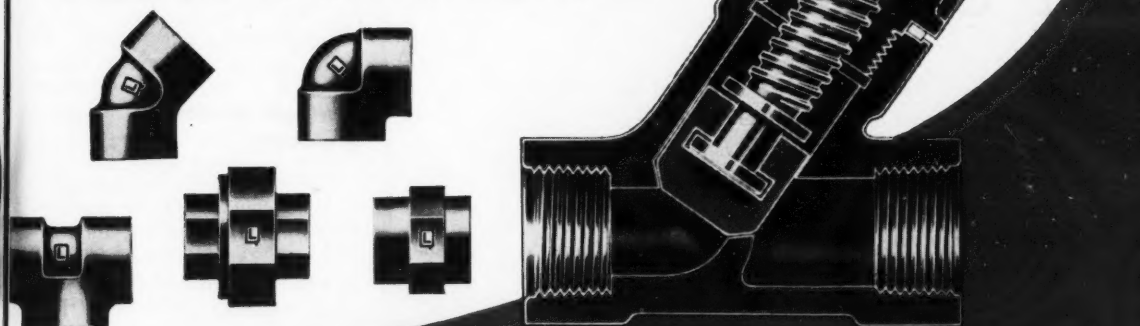
You can cut your corrosive fluid handling costs with the first all-plastic valve designed and engineered by a valve manufacturer!

The new LUNCOR Valve, by Lunkenheimer, is made of rigid, unplasticized PVC. Every part is completely molded — body, bonnet, stem, and handwheel. The molding process not only gives it amazing strength, but protects its resistance to corrosion. You get time-tested Lunkenheimer quality — at surprising savings. If you have been using stainless steel or alloy valves for corrosive service, it will pay you to investigate the new LUNCOR Valve and Fittings . . . now.

Basic material used for the LUNCOR Valve is polyvinyl chloride (PVC), which resists most industrial chemicals. It is recommended for service at pressures up to 125 psi and temperatures up to 140°F.

A complete line of LUNCOR PVC Fittings is also available from Lunkenheimer — 45° and 90° elbows, tees, flanges, unions, reducing bushings, caps, couplings, and plugs.

For full details, call your local Lunkenheimer Distributor, or write The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.



LUNKENHEIMER

NAME IN VALVES

When inquiring check CP 4449 on handy form, pgs. 2-3

JANUARY, 1955

NEW SOLUTIONS of processing problems

was essential that all ferrous contamination be removed from the pigments prior to pulverizing.

Processing dry color pigments consists of forming filter press cake, drying, breaking pigments into lumps, and feeding them into series of pulverizers which reduce particle size to under 10 microns.

Solution: Company installed permanent non-electric grate and hopper magnets at top and throat of each of the eight mills. Grate magnet is 32½" long by 32" wide and consists of series of 1" diameter stainless steel tubes within which are



Grate magnet, installed in top of mill hopper, removes tramp iron and minute rust particles from color pigments. Another magnet (disc type) is installed in hopper's throat

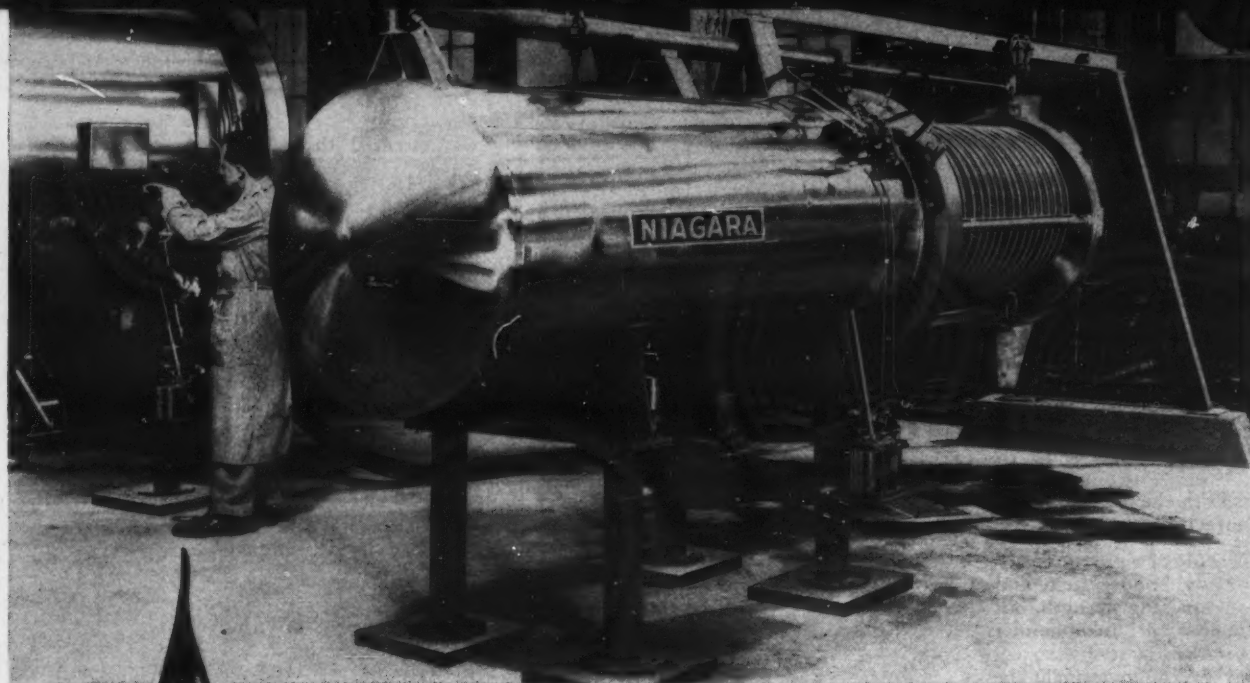
non-electric Alnico V castings. Tubes are spaced on 2" centers. Steel grill serves to slow down and direct pigment stream onto magnetic tubes.

Pigments pass through grate magnet and down into throat of mill hopper where hopper magnet is located. Separator consists of series of steel discs spaced at 1" centers with cylindrically shaped Alnico V castings occupying spaces between discs. Magnet is lowered into hopper and provides barrier covering entire discharge opening.

Results: Engineers report that not a single bit of tramp iron has passed magnets. Separators can process several hundred pigments poured into mills at 500 to 3000 lb/hr. Officials estimate annual savings for mills — in terms of damage to equipment, time lost in repairs, and fire losses — at \$6000.

(Grate and hopper magnets are product of Eriez Manufacturing Company, Dept. CP, 1945 Grove Drive, Erie, Pa. Check CP 4450, pages 2 and 3.)

L-156-9



How you can get MAXIMUM FILTRATION EFFICIENCY at lower cost

Unless a filter can be depended upon for maximum clarity *at all times* . . . it isn't very efficient.

And if downtime between cycles is out of balance with productive time . . . it's not very economical.

A Niagara Horizontal Filter will filter to clarity at rates up to 45,000 GPH . . . and maintain that degree of clarity hour after hour. Niagara flow rates are 2 to 5 times greater than those of old fashioned cloth covered presses.

Furthermore, a Niagara can be taken off stream, drained, opened, cleaned, closed, filled and precoated by one man *in a matter of*

minutes, not hours. And since no cloths are required for most operations, there's a tremendous saving in material, time and labor.

These are just a few of the reasons why your Niagara Filter will help you improve product quality, cut production time and reduce costs. It's easy to see why Niagara Filters pay for themselves in a remarkably short time.

Talk it over with a Niagara Filtration Engineer. These men are specialists in liquid-solids separation. They'll analyze your filtration problems . . . test your samples . . . pilot the filtration . . . and build a Niagara to meet your most exacting requirements. Mail coupon for details.

Niagara FILTERS

A DIVISION OF

American Machine and Metals, Inc.

DEPT. CP155, EAST MOLINE, ILLINOIS

YES . . . we'd like to know more about Niagara Pressure Leaf Filters for _____

☐ Send new catalog NC-1-53

☐ Have representative call

Name and Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Specialists in Liquid-Solids Separation

NEW SOLUTIONS

Coating does a good job stopping condensation on water filters . . .

company uses material to
patch damaged insulation

Problem: At the Filer City, Mich., mill of the American Box Board Company, non-sweat insulation on cold water filters occasionally is damaged. A method of patching was required so that the original non-sweat characteristics of the insulation would be retained.

Solution: Company applied NoDrip asphaltic coating to the damaged portions. Coating can be applied by brush, spray, or trowel.

Results: Coating is doing a good job for non-sweat insulation, according to supervisors at the company. It has been found to be easy to apply and has a good appearance.

(NoDrip coating is product of J. W. Mortell Co., Dept. CP, Kankakee, Ill. . . . or for more information check CP 4451 on handy form, pages 2 and 3.)

Discusses pipeline problems

Problems involved in transporting liquid petroleum products through pipelines are discussed in 12-page bulletin. Complete with charts and drawings, bulletin describes typical pipe line system, variables to be measured, and problems of pipe line control.

Bul PL-1 is issued by Industrial Division, Minneapolis-Honeywell Company, Dept. CP, Wayne and Windrim Avenues, Philadelphia 44, Pa. When inquiring specify CP 4452 on handy form located between pages 2 and 3.



For more information on product at left, specify CP 4453 . . . see information request blank between pages 2 - 3.

NEW SOLUTIONS

Batching scale protects secret formulae . . .

weight record is locked up on printed tape inside scale

Secret control over product formulation, even among firm's own employees, is typical of the brewing and certain other facets of the food processing industry.

In order to protect the formulae the Olympia Brewing Co., of Olympia, Washington has installed a 10,000 and a 5000 lb capacity hopper scale which record ingredient weights on a printed tape locked up inside the scale for effective protection.

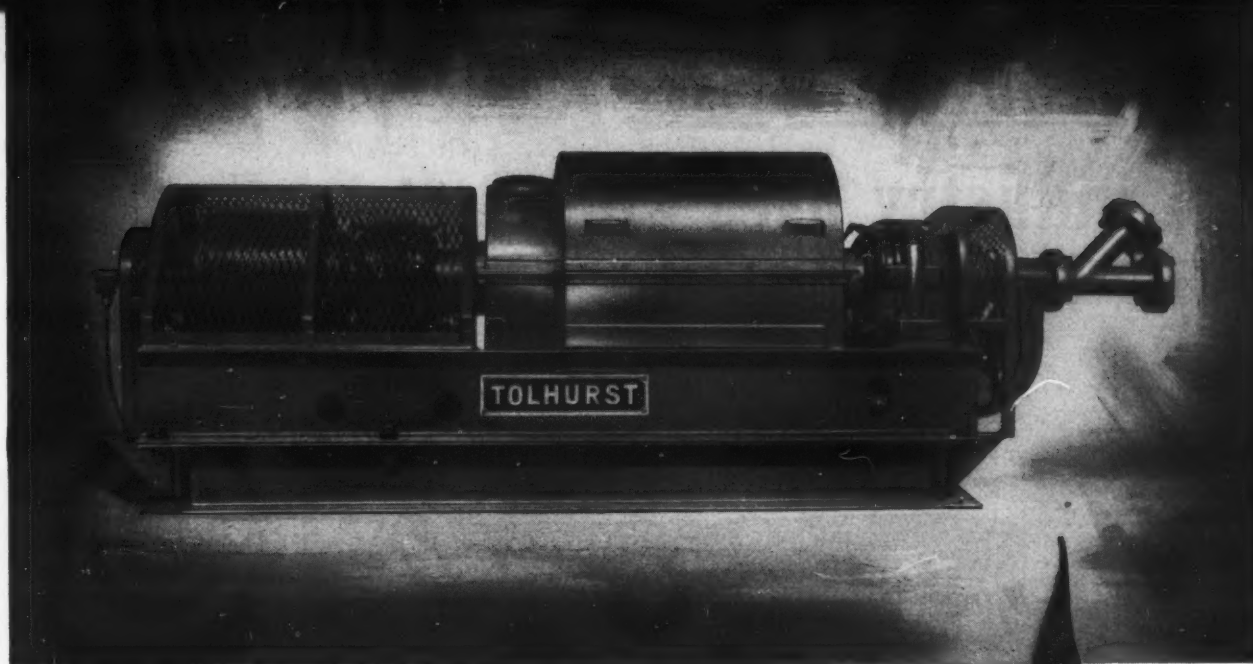
Materials to be weighed are fed to appropriate hopper by Airveyor system. An interceptor on reverse reading chart is set for amount of material to be weighed in each batch with due allowance for dribble which will follow into weigh hopper after feeder gate is closed and batch is in.

When predetermined volume is reached, interceptor crosses photoelectric cell and a circuit is energized which closes feeder gate. As dial pointer comes to rest, operator pushes control button on scale which prints weight, code letter, and numbers as set up on the designating letter and number banks to indicate type of material and formulae used in batch.

Weight record is locked up on printed tape inside hopper dial scale. Only head brew-master or authorized person has access to information.

(Printomatic batching scales are development of Fairbanks, Morse and Co., Dept. CP, 600 S. Michigan Ave., Chicago 5, Ill. . . . or for more information concerning product, reader may simply check CP 4454 on the convenient Reader Service slip which is located between pages two and three.)

For more information on product at right, specify CP 4455 . . . see information request blank between pages 2 - 3.



THIS NEW CENTRIFUGAL

handles one material continuously
...or several materials intermittently

Here is the most flexible continuous centrifugal ever designed. For example . . . if you run continuously on a single product, your Tolhurst "Maxi-Flex" can be instantly adjusted to take care of process fluctuations or variations in technique. Beach speeds can be changed at a moment's notice from 0 to 300 inches per minute. A simple adjustment gives you any one of seven different pool depths. And the proper settling rate for maximum efficiency is assured by an available force field which can be varied up to almost 2000 times gravity.

Or . . . if you want to make short runs of several different products you can still enjoy

the advantages of continuous centrifuging. Simply adjust beach speed and pool depth to suit each run. And the self-cleaning feed chambers make the change-over from one product to another a quick, simple operation with minimum downtime.

The new Tolhurst "Maxi-Flex" Continuous Centrifugal has been under field and laboratory tests for more than three years. It has fully proved its ability to handle a wide variety of materials with amazing speed, efficiency and economy. Perhaps this is the equipment you need to improve your operation. May we tell you about it?

Tolhurst CENTRIFUGALS
A DIVISION OF
American Machine and Metals, Inc.

DEPT. CP155, EAST MOLINE, ILLINOIS

☐ Send illustrated literature describing the new Tolhurst "Maxi-Flex" Continuous Centrifugal

☐ Have representative call

Name and Title. _____

Company. _____

Address. _____

City. _____ Zone. _____ State. _____

Specialists in Liquid-Solids Separation

For positive, stepless speed selection all industry uses Link-Belt P.I.V.



Operates independent of friction from maximum to minimum speeds

FOR speed changing that's completely positive . . . completely stepless—Link-Belt's P.I.V. has no equal. Here's a totally enclosed all-metal variable speed drive that provides exact speed selections—

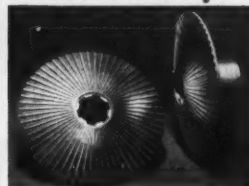
independent of friction. Following are just a few of the jobs P.I.V. performs with matchless precision:

- Exact synchronization of rotating parts and machines

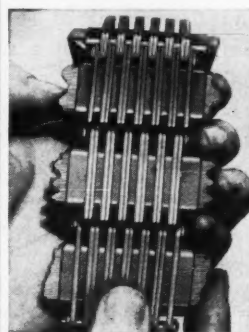
- Accurate control of process speeds
- Precise regulation of rotary motion
- Flexible, accurate timing
- Stepless control of production lines or individual machines

Find out how P.I.V. can extend the useful range of your machine operations. Your Link-Belt office or distributor will give you all the facts. Call today, or write for Book 2274.

Here's the inside story



NO SLIPPAGE — HERE'S WHY!
Teeth of the radially grooved wheels (above) are cut at a constant depth but are of increasing width toward the wheel periphery. The sides are beveled to provide gripping areas for the self-tooth-forming chain (below). The chain slats shuffle back and forth between the wheels—mesh fully when they engage.

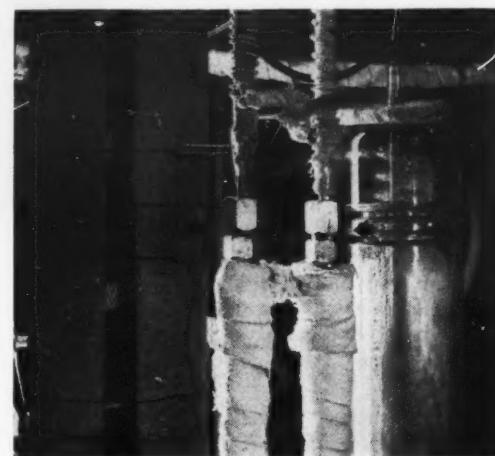


NEW SOLUTIONS of processing problems

No leakage with packing glands used to vary height of U-tube on laboratory column . . .

solvent at 200°F satisfactorily handled by unit for 1½ years at Shell Oil

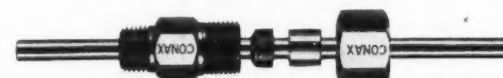
Problem: On a laboratory extraction column being used at Shell Oil Company, Houston, Texas, fittings were required that would permit variation of the height of U-tube on overflow line. Varying height of U-tube adjusts internal level of solvent



Close-up view of packing glands (arrows) used on overflow line of laboratory extraction column

phase in extraction column. Solvents had to be handled at temperatures up to 200°F without leakage.

Solution: In April 1953, packing glands shown in accompanying photographs were installed on U-tube. Tube slides into packing gland and cap



Exploded view of a typical packing gland

is tightened against Teflon ring. Positive seal is assured by soft packing without damage to tubes. Glands are machined entirely from 303 stainless steel.

Results: Packing gland has functioned satisfactorily at Shell for 1½ years with no leakage. Height of U-tube can be easily varied as required. Glands are neat and compact. No maintenance on them has been necessary.

(Packing glands are product of Conax Corporation, Dept. CP, 4515 Main St., Buffalo 21, N. Y. . . or for more information reader may simply check CP 4457 on the convenient Reader Service slip which is located between pages 2 and 3.)

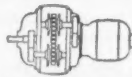
4 of 16 P.I.V. types — ½ to 25 hp — ratios to 6:1



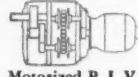
Basic P.I.V. Like all others, it is built for horizontal or vertical mounting.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.



LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

When inquiring check CP 4456 on handy form, pgs. 2-3

NEW SOLUTIONS

Nickel-plates aluminum without intermediate bonding material . . .

process works on either raw
or anodized stock

An electroplating process announced recently applies nickel directly to either raw or anodized aluminum. Process solves a heretofore major problem by eliminating need for an intermediate bonding material, such as copper or adhesive cements, formerly necessary in plating.

The thin deposits of nickel provide surface that is resistant to erosion, pitting, gouging, and corrosion. When applied to both surfaces of aluminum sheets, they greatly strengthen the aluminum without materially increasing weight.

Intricate designs and shapes can be given stress-free, ductile, and pore-free surface of any required thickness. Material produced can be sheared, bent, fabricated, and will not separate at high temperatures.

Hardness of nickel deposit in process can be varied over 150 to 550 Vicker range.

Nickel can be applied in layers with either compressive or tensile stress.

(Alni-Clad process is development of Bart Laboratories Company, Incorporated, 227 Main Street, Belleville, New Jersey . . . or for more information concerning manufacturer's product, reader may simply check CP 4458 on the convenient Reader Service slip which is located between pages two and three.)

◀ For more information on product at left, specify CP 4459 . . . see information request blank between pages 2 - 3.

For more information on product at right, specify CP 4460 . . . see information request blank between pages 2 - 3. ▶

FAMOUS LIGHTHOUSES OF AMERICA



SANDY HOOK LIGHTHOUSE, built in 1764 by the Colony of New York, is the oldest original light tower in use in the United States. A massive structure, octagonal in form with walls of stone seven feet thick at the base, it stands today as it was built except for an added inner lining of brick. This famous lighthouse is located on a narrow peninsula on the New Jersey coast sixteen miles due south of New York City and still helps to guide ships into New York's lower bay.

**Sure guidance for users of electrochemicals is the long-recognized quality of
Niagara Alkali products. A pioneer in this field, Niagara has helped manufacturers
improve their products and the efficiency of their processes through the use of
Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash,
Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene,
Niagathal® (Tetrachloro Phthalic Anhydride).**

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

If you're mixing one of these products
... or any wetted or pasty solid material

HERE'S YOUR HANDBOOK ON MULLING!

bulletin 522

SIMPSON MIX-MULLERS

ABRASIVES
ADHESIVES
ALUMINUM FLUX
ANIMAL FEED
ARTIFICIAL STONE
ASBESTOS INSULATORS
ASPHALT PRODUCTS
ASPHALT TILE
BATTERY PASTE
BRAKE LINING
CARBON PRODUCTS
CATALYSTS
CERAMIC TILE
CHARCOAL BRIQUETTES
COAL BRIQUETTES
COSMETICS
CRUCIBLES
DETERGENTS
DRY BATTERY
COMPOUND
DYE AND BLEACHING
POWDERS
ENAMEL FRIT
EXPLOSIVES
FERTILIZERS
FOOD PRODUCTS
GLASS BATCHING
GLAUBERS SALT
GRAPHITE
GREASE
INSECTICIDES
LEAD PENCIL STOCK
NICKEL OXIDE
PAPER COATINGS
PHARMACEUTICALS

MULLING

... FOR THE CHEMICAL AND PROCESS INDUSTRIES

PIPE SEALING
COMPOUNDS
PLASTER
PLASTICS
PORCELAIN
POTTERY
POWDERED METALS
PUTTY
REFRACTORIES
ROOFING GRANULES
RUBBER COMPOUNDS
SOAP
SYNTHETIC FUELS
THERMITE WELDING
MATERIALS
TITANIUM DIOXIDE
TOBACCO
TRANSITE SCRAP
RECLAMATION
WATER TREATMENT
COMPOUNDS AND
BOILER COMPOUNDS
WELDING ROD
COATINGS
WOOD FIBER
SAWDUST,
RESIN, ETC.
ZIRCONIA

national engineering company • chicago 6, illinois

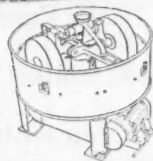
There's nothing new about mulling—it dates back to the tethered ox and stone wheel. What is new is industry's increasing need for the kind of blending that can be realized only with mulling.

Here's your chance to find out more about how mulling can fit into your picture. See why and where it differs from ordinary mixing methods... how, through uniform blending, you can make the most of today's, all too valuable, ingredients—yet prepare the mix faster and more economically.

And, of course, we talk about Simpson Mix-Mullers. So will you—after you've read the specs on the new F Series. 40 years of mixing experience on processing materials from Abrasives to Zirconia have made the name Mix-Muller synonymous with quality mixing... and every hour of that experience is built-in to the new F Series.

So, if you mix, and it's wet but not a fluid... dry but not a powder, bring your catalog file up-to-date on the latest in mulling! Send for the free Mix-Muller Handbook, on your letterhead please, today.

FOR YOUR CONVENIENCE in determining the proper cubic foot batch capacity range to fit the character of your product, a table for converting your present measurement of substances... from Alcohol to Zinc Ore, is included in the new Mix-Muller Handbook.



SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.
(Not Inc.)



NEW SOLUTIONS

Only two moving parts on solenoid valve...

simple design permits ease
of installation, maintenance

Problem: Method of providing automatic cycling control was sought by midwestern company for several of its processing units. Operating requirements call for 27 to 29 inches vacuum (mercury) to be alternately held and released at rate of 2 cycles per minute in their machines.

Solution: Company installed "DO" (diaphragm operated) solenoid valve on either side of vacuum storage tanks serving machines. Valves are limit switch actuated and provide full port openings all the way through.

Positive shut-off safety is assured by soft seat design which compensates for wear. Valve disc diaphragm is synthetic rubber. Rim of diaphragm serves as gasket and assures correct alignment of solenoid plunger and valve disc. Device has only two moving parts — solenoid plunger and synthetic rubber diaphragm. Design eliminates need for gaskets, valve guides, and pilot valve-gages.

Units can operate on line pressures as high as 150 psi, are pilot operated, with line pressure furnishing activating force. Power is required only to lift solenoid plunger.

Results: Valves provide instantaneous release with minimum pressure drop. Easily installed, units may be serviced without removal from line. Diaphragm can be replaced in matter of minutes by removal of four screws.

(Valves are product of Eclipse Fuel Engineering Company, Dept. CP, 1119 Buchanan Street, Rockford, Illinois... or check CP 4461, pages 2 and 3.)

For more information on product at left, specify CP 4462... see information request blank between pages 2 - 3.

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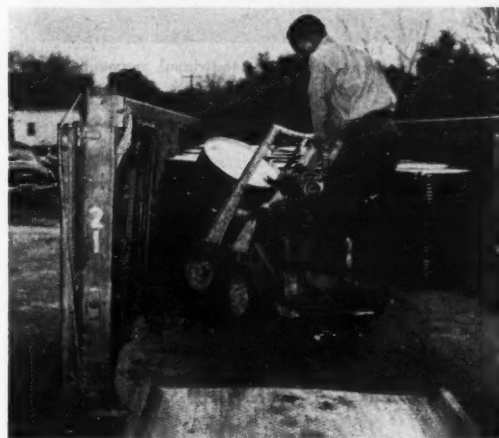
NEW SOLUTIONS of processing problems

Drum handling simplified by small, lightweight motorized truck . . .

cuts loading time 30-50 per cent on large shipments

Lightweight, compact, motor-driven drum truck used at a midwestern chemical company is a good example of how a company can speed up a routine operation. Truck is used for loading operations and other drum-moving jobs around the plant. Company produces lubricants, cutting and grinding oils, for which the drums are used.

Products are shipped in 55-gallon drums weighing about 550 pounds when full. On large shipments (40 or 50 drums), officials estimate that unit cuts loading time 30-50 per cent (not to mention employee fatigue) over previous hand-truck method.



Highly maneuverable, motorized drum truck speeds loading operations. Truck is only 34" wide, fits easily in narrow aisles

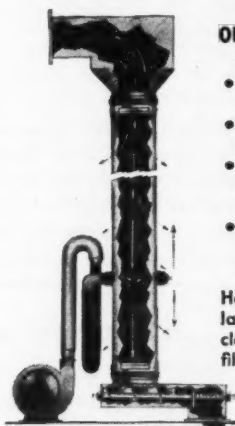
Truck is 81" long, 34" wide, and 55" high — weighing about 990 pounds. It will operate in 56" aisles and turn on a 68" radius. Simple to operate, truck requires minimum maintenance and operating expense. Steering is easy, and forward, reverse, and braking are controlled by foot pressure on a single pedal.

Power is supplied by a 7½-hp gasoline engine. Drums are handled by a hydraulically-operated tilt-back, actuated by hand control lever. Truck has forward speed of 7 mph and reverse speed of 5 mph. Machine has pneumatic rubber tires. Utility plate for handling other objects than drums can be attached to front.

(Model 201 Xpediter is product of Kalamazoo Manufacturing Company, Dept. CP, 1827 Reed Street, Kalamazoo, Michigan . . . or for more information reader may simply check CP 4462A on the convenient Reader Service slip which is located between pages 2 and 3.)



...including DUST CONTROL



Licensed by H. J. Hersey, Jr.

Diagram of operating design of filter tube.
(Available in multiples of 4, 8, 12, 16 and 32 tubes)

OUTSTANDING DAY REVERSE JET FILTER ADVANTAGES

- 99.99+ % Filtering Efficiency
- Up to 5 Times Higher Filtering Rates
- 100 per cent of Equipment Investment Is in Operation at All Times
- Smaller Size with Higher Capacity Saves Valuable Plant Space

Handles 5 times more dust laden air per square foot of cloth than conventional dust filters.

The automobile has changed America's living habits and the DAY High Pressure Reverse Jet Filter has changed American industries' dust control methods. To match the challenge of changing times and changing needs DAY leadership revolutionized the control of dust by utilizing the Hersey principle of filter cloth cleaning with HIGH PRESSURE REVERSE JET AIR. This advanced type of filter handles FIVE TIMES MORE DUST LADEN AIR per square foot of filter cloth than conventional filters. This is the most important improvement in dust filtering in 50 years.

Modern manufacturing methods demand modern dust control methods. There is nothing that will match the high on-the-job efficiency provided by DAY filters. It is a proven fact that one DAY filter recommends another. DAY High Pressure Reverse Jet filtering has been used by leading companies for more than 5 years. 87% of DAY filter users have ordered additional DAY Reverse Jet Filters. For maximum filtering results from a minimum filter investment write for complete facts. DAY gives you tremendous savings in valuable plant space, installation and maintenance costs.

Write to DAY for FREE Bulletin 528-R, about America's most advanced dust filter.



The DAY Company

852 Third Ave. N. E. • Minneapolis, Minnesota
IN CANADA: P.O. Box 70 Y, Ft. William, Ontario
Branch Plants: Buffalo, Ft. Worth and Toronto, Ontario
Representatives in Principal Cities



AIR POLLUTION with DAY DUST CONTROL

When inquiring check CP 4463 on handy form, pgs. 2-3

AGILENE (POLYETHYLENE)

AGILIDE (NON-PLASTICIZED) (POLYVINYL CHLORIDE)

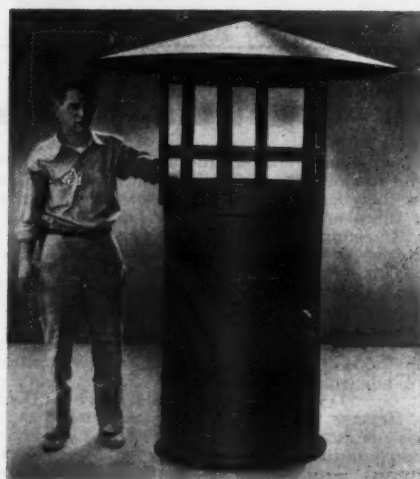
"Barriers AGAINST CORROSION"

PLASTIC FABRICATIONS FOR THE CHEMICAL HANDLING INDUSTRIES

MODERN MATERIALS OF CONSTRUCTION



Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE—fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



AGILENE® 28" diameter x 7' high discharge stack and weather cap for conveying HCL fumes, replacing alloy steel fabrications. Stack is of seamless cast tubing and double cone weather cap provides least back pressure on system. This self-supporting structure is of black pigmented AGILENE® to give 15-20 years outdoor exposure to ultraviolet light from sun's rays.

AGILENE® is completely inert to HCL fumes, satisfying customers' complete requirements at lowest possible cost.

American Agile Corporation

Plant and General Offices • 3461 Durham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 158 • Bedford, Ohio

DEPT C-1

new solutions of processing problems

Bergstrom Paper Company
treats a million gallons of
de-inking waste a day . . .



Disc type filter used in waste treatment plant. Individual segments of each disc can be removed when necessary to replace cloth. However, use of nylon cloths has practically eliminated this procedure

removes all readily settleable solids

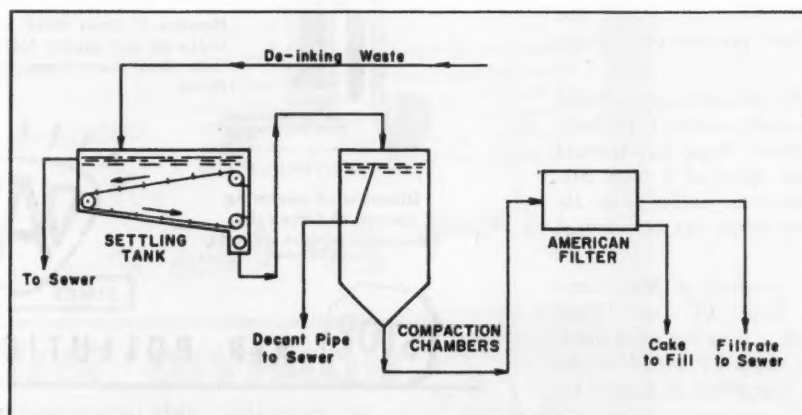
R. M. ELIAS, Mill Superintendent
Bergstrom Paper Company
with DANA B. BERG, Managing Editor

Problem: Solids, primarily clay, in paper de-inking waste from Bergstrom Paper Company, Neenah, Wis., made extra work for the city's sewage treatment plant. Special handling was required for the non-combustible material, since the municipi-

pal plant customarily burned its sludge. Pollutionary effect of this waste is silting, since the sludge has neither critical B.O.D. characteristics nor toxicity.

The average amount of sludge in a day's flow of de-inking wastes is about 20 tons (dry basis). The sludge is not re-used because it can't be bleached.

Bergstrom de-inks about 100 tons of waste magazine and book paper per day in continuous process. Bleached stock from this source is combined with virgin pulp in making book papers.



Simplified flowsheet of
Bergstrom Paper Com-
pany's waste treatment
plant

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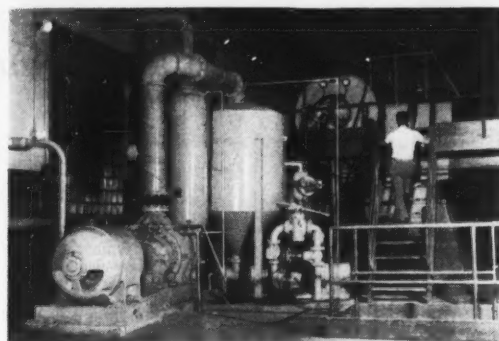
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Oliv
hand

Solution: In January of 1953, the company started operating its new plant for treatment of de-inking wastes (see flowsheet). Process is the result of tests performed by Bergstrom in connection with Nat'l Council of Stream Improvement.



Vacuum-producing and vapor-separating equipment used with treatment-plant filter

Waste water from the de-inking process is piped to the 64 x 20 x 15' deep settling tank. The sludge settles out and is continuously scraped to one side, whence a screw forces it to a pump which empties it into one of the three "compaction" chambers (sloping-bottom storage tanks). Water from top of the settling tank overflows to sewer.

Clear water from top of the 17 1/2' square by 30' high compaction chambers is decanted to the sewer. Sludge, by now 8% solids on a dry basis, is pumped by Moyno pumps to continuous, disc type vacuum filter (12'6" diam American with approx. 2000 sq ft filter area). Filtrate goes to sewer, while the cake (30% solids on dry basis) falls onto a conveyor which dumps it into a truck.

The truck takes the putty-like clay sludge a short distance to swampy area of Little Lake Butte des Morts, adjoining the plant. A 32-acre area, made available by the city, is being filled in.

At present, the filter only has to operate about one day out of four. Lime is used as a filter aid. It is introduced as a slurry just ahead of the pumps which handle sludge from compaction chambers.

When operation first began, cotton cloths were used. These wore out quickly in this service, so nylon was substituted in May of 1953. Cloth replacement is now next to nothing.

Results: Company's treatment plant has relieved the load on the municipal plant. It handles close to one million gallons of de-inking waste per day, removing all of the readily settleable solids. Steps are now being taken to improve the settling procedures for more efficient solids removal.

(American disc type filter is a product of Dorr-Oliver, Inc., Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 4465 on handy form, pages 2 and 3.)

Gyratory Screen

Produces Soda Ash for Glass Making

...ars. glass makers
...money in the manufacture of soda ash, according to Mathieson Chemical Corp.

Using this machine, Mathieson is producing a new coarse light soda ash product suitable for glass making. The new product, Mathieson believes, could eventually supersede "dense" soda ash heretofore generally used by glass plants.

To produce coarse light soda ash, Mathieson is completing a plant at its Saltville, Va., location that will produce 50,000 tons per year. It starts operating this fall. The new soda ash from this plant will be offered in bulk carload lots at \$28 per ton f.o.b. Saltville.

To further the development and make the product available to all glass makers, Mathieson has revealed that the new ash is made with a machine that has been used by the milling industry for years to sift flour. The device is a dynamically balanced gyratory sifter, and Allis-Chalmers furnished the sifters for the new soda ash plant at Saltville.

The coarse light ash has been used in the commercial production of glass, and large-scale tests in glass plants show it to have all of the necessary physical properties to make good glass.

After gaining operating experience in the new Saltville plant, Mathieson expects to install additional facilities for producing the new coarse ash.

- Eliminates need for soda ash densifying plant
- End product has all the physical properties needed to produce quality glass
- Enables manufacturer to offer finished product at lower cost

**GYRATORY
CIRCLE
SIFTER**

This is just another example of how Allis-Chalmers equipment is helping solve today's chemical processing problems.



Reproduction of article in Chemical Engineering

You can use an all-metal gyratory Circle sifter to separate dry granular products into two, three or four predetermined sizes. Silk or metal cloth screens of 2 to 350 mesh may be used.

FOR MORE INFORMATION about Circle sifters or other Allis-Chalmers equipment for your industry, call your nearest A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4329



Circle is an Allis-Chalmers trademark.

ALLIS-CHALMERS

When inquiring check CP 4466 on handy form, pgs. 2-3

NEW SOLUTIONS

Advantage for customer given by pour spout on wax pails . . .

T. F. Washburn uses several thousand per month

An advantage for the customer in ease of pouring without spillage is furnished by spout on pails used for floor wax at T. F. Washburn Co. The Chicago manufacturer



Pails with reversible spout being filled with floor wax

uses several thousand pails per month that are fitted with the pour spout. After pail is received by customer, it can be easily prepared for pouring by punching in top and pulling out the spout.

(Pour spout is product of U-Pressit Prod. Corp., Dept. CP, Danbury, Conn. . . . or for more information check CP 4467 on handy form, pages 2 and 3.)

Titanium process operated by remote control . . .

process minimizes danger to personnel

Titanium ingots are being produced by a double melting process operated by remote control. System is designed to minimize personnel hazards and assure continuity of production. Although metal itself is not a combustible or hazardous material, the high temperatures involved in melting require precautionary measures.

PROVEN by 8 years

THOUSANDS of Successful Installations of Farris "4 in 1" Safety Relief Valves*

NOTICE:

Farris Safety Relief Valves, the Internal Heat Exchanger, and Bellows construction are covered by U.S. Patents and Patents Pending. Copyrights, where applicable, are registered.

STANDARD FULL NOZZLE SAFETY RELIEF VALVES

Here is the ultimate in nozzle valve construction with complete standardization and interchangeability in every part:

Round wire springs calibrated for rating.

2½ to 1 guiding ratio, close tolerances.

Alignment spool for perfect alignment and bearing from stem to disc.

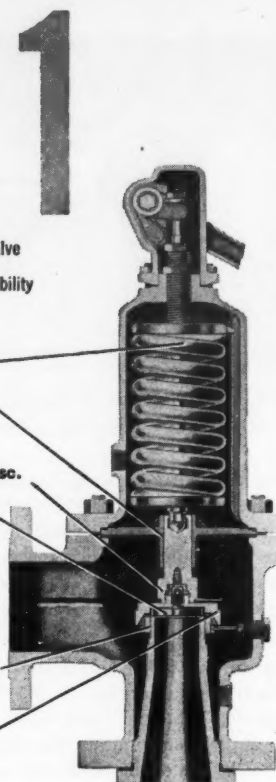
Self-aligning, optically-flat replaceable disc of forged Stainless Steel.

All bearings of hardened Stainless Steel.

Expanded orifices increase capacity.

Single blowdown ring does not affect capacity—simple adjustment.

Flared disc-holder for ultimate operating efficiency.



BALANSEAL® SAFETY RELIEF VALVES

BalanSeal construction isolates all working parts. It consists of a neutral area bellows equalling the area of the seating surface, incorporating a mechanically-held seal for the lower part to greatly enhance replacement. BalanSeal can be simply installed any time. Because BalanSeal neutralizes effects of back pressures, resulting in a constant, safe relieving point on the upstream side, size of back pressure piping can be drastically reduced—for pipe savings up to 15 times the cost of the valve! Where accurate set points must be depended upon, BalanSeal stands alone.

For eight years Farris has been setting-the-pace-in-safety with "4-in-1" Safety Relief Valves, the "standard" for long service life, minimum maintenance and positive protection.

Farris' recognition as the pace-setter of the industry is no accident, but the result of many engineering "firsts" in improved valve design—FIRST with balanced bellows construction . . . FIRST to offer multiple nozzle sizes within one valve . . . FIRST with a line of bar stock safety-relief valves for pressures to 10,000 lbs. . . . FIRST to offer internal heat exchangers . . . FIRST to offer realistic pricing, giving the customer the benefit of manufacturing economies . . . and only Farris can point to proved-in-service performance . . . because Farris is the pioneer manufacturer of safety relief valves with bellows.

FOR ENGINEERS: Catalog 48Ra on the full line of Farris Safety Relief Valves; and Technical Manual 51B—"Principles of Manifold Discharge Piping". Available on request.

"THE FOX AND THE HARE"



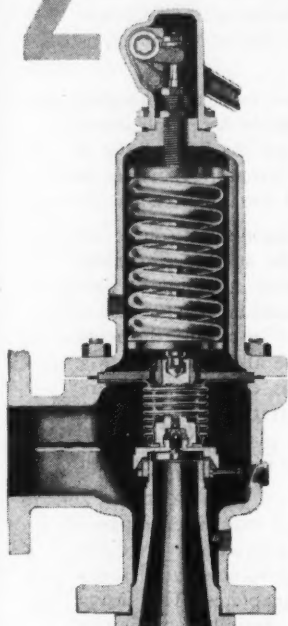
Send for this popular entertaining pamphlet presenting a story about the recognition of BALANSEAL valves. It is humorous and enlightening. Just ask for it by name.

of ACTUAL SERVICE

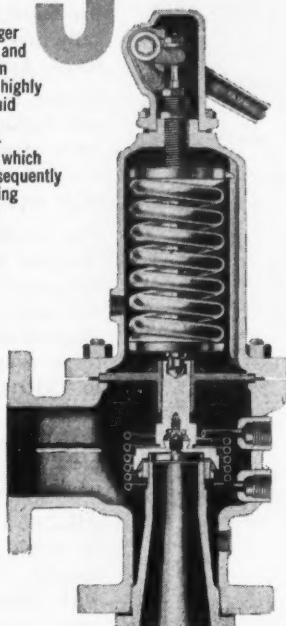
2

INTERNAL HEAT EXCHANGER

The exclusive Farris Internal Heat Exchanger eliminates inefficient and costly steam tracing in a valve body to keep highly viscous media in a fluid state. It consists of a stainless steel coil inserted in the body to which steam is fed and subsequently trapped out. For placing heat where it is most effective, increasing efficiency, lowering steam consumption, the Farris Internal Heat Exchanger is the only available product of its kind.



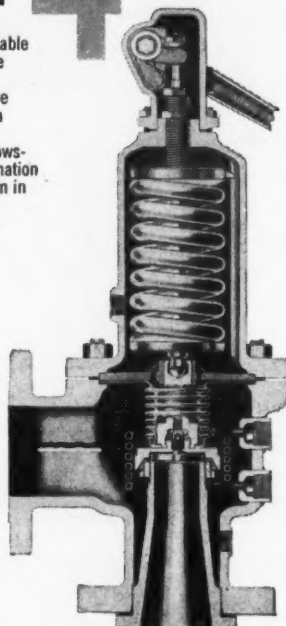
3



BELLOWS— HEAT EXCHANGER COMBINATION

For completely dependable valve operation in spite of sticky fluids (tars, asphalt, etc.) and where complete freedom from contamination is required, select the Bellows-Heat Exchanger combination . . . The ultimate design in safety relief valves for applications where material is highly viscous. All parts are Farris Standard construction.

4



*CERTIFIED AND APPROVED by the National Board of Boiler and Pressure Vessel Inspectors, complying with ASME requirements. Tests made at university laboratories by independent observers. Certification data available on request.

*and Still the
Lowest Prices
in the industry!*

Coming Soon!

An added line of
ultimate capacity
nozzle valves

Farris

ENGINEERING CORPORATION

410 COMMERCIAL AVENUE, PALISADES PARK, NEW JERSEY

Affiliates: Farris Flexible Valve Corp. • Farris Stacon Corp. • Farris HydroTorque Corp.

Farris HydroSeal Corp. • Farris Pickering Governor Co.

NEW SOLUTIONS

Technicians who operate process are stationed at remote control panels out of sight of furnaces, behind concrete walls. Furnaces operate at higher pressures than commonly encountered, and are vented outside buildings. Plant is melting unalloyed titanium and full range of titanium alloys.

(Process by Mallory-Sharon Titanium Corporation, Dept. CP, Lock Box 269, Niles, Ohio.)

Tanks heat, clean easier with plate-coil walls

Improved method for heating tanks has been developed. Instead of using conventional pipe coils, plate-coils are structurally built into walls of tanks. Method is efficient and reduces heating costs.

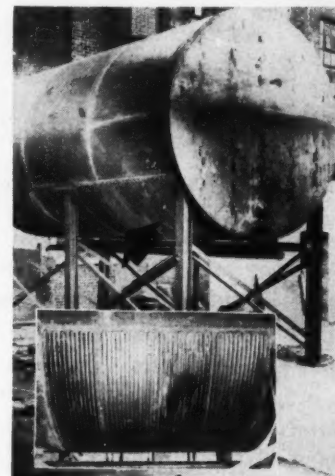


Plate-coils (inset) built into tank (arrow) improve heating

Materials flow easier and cleaning out tanks is simplified. System works well for keeping asphalt, chemical-solution, oil and storage tanks warm.

(Tanks are product of Thermo-Panel Division, Dean Products, Inc., Dept. CP, 616 Franklin Avenue, Brooklyn, New York.)

For more information on product at left, specify CP 4469 . . . see information request blank between pages 2 - 3.

COMPARATIVE PROPERTIES OF ORGANIC ACIDS

	Sunaptic Acids			Low MW Naphthenic Acids	Oleic Acid	Stearic Acid
	A	B	C			
Acid number (mg KOH/gm)	178	159	122	235	199	197
Unsaponifiables (% by wt) ¹	5.6	6.3	9.1	12.5	—	—
Sp gr (@ 20°/4°C)	0.988	0.987	0.992	0.972	0.895	0.847
Viscosity (SUS @ 210°F)	106	159	624	40.1	41.7	—
Bromine No. ²	10.0	10.7	12.1	5.1	56.6	2-5
Refractive index (N _D ²⁰)	1.498	1.503	1.516	1.476	1.458	1.430 ⁴
Pour point (°F)	25	40	75	—30	55	148
Average molecular weight of deoiled acids ³	297	330	415	206	282	284
Average molecular formula	C ₁₈ H ₃₄ O ₂	C ₂₁ H ₃₇ O ₂	C ₂₅ H ₄₄ O ₂	C ₁₃ H ₂₄ O ₂	C ₁₈ H ₃₄ O ₂	C ₁₈ H ₃₆ O ₂

¹ AOCS C₆6a-40

² ASTM D 1158-52T

³ Calc. from Acid No. and % Unsaponifiable

⁴ @ 80.2°C

Specially refined from Gulf Coast crude oils —

high molecular weight naphthenic acids have low volatility, pour point

Oxidation resistance imparted to chemical derivatives

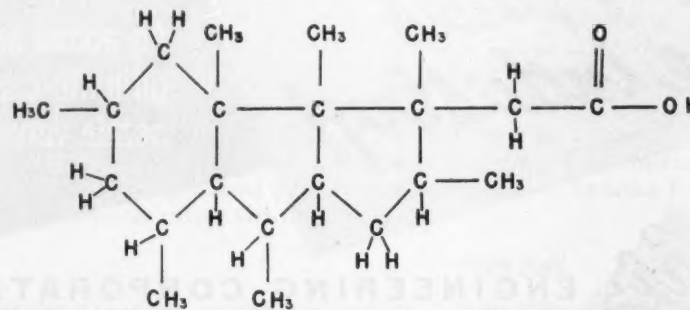
Uses: Naphthenic acids constitute a source of raw materials from which a wide variety of commercially important products may be manufactured. Various industrial applications of organic naphthenic acid derivatives are as anti-oxidants, corrosion and rust inhibitors, detergents, emulsion breakers, and plastic intermediates.

Sodium and potassium soaps of the naphthenic acids make valuable emulsifiers, detergents, and surface-active agents and find use in textile processing, cutting and spray oils, and rubber polymerization. Suggested uses for the alkaline earth or heavy metal soaps are: adhesive component, anti-skinning agent, curing accelerator, mildew-proofer for paints, paint grinding aid, paper sizing, pigments, stabilizers, and waterproofing.

Features: These high molecular weight acids react chemically in the same manner as fatty or rosin acids, and in certain respects resemble them (for example, their alkali soaps). However, the acids are distinguished from the fatty or rosin

acids by absence of olefinic unsaturation, high resistance to oxidative rancidity, higher solubility in hydrocarbons, lower freezing or pour points, and an inherent fungicidal property.

These distinguishing characteristics of the acids are reflected in the properties of derivatives pre-



REPRESENTATIVE STRUCTURAL FORMULA

Formula represents one of many possible types of high mw naphthenic acids. Empirical formula, C₂₁H₃₄O₂, corresponds to a mw of 320 and a theoretical acid number of 175. Characteristic features are:

- 1 — One carboxyl group per molecule. Most applications depend upon the activity of this group.
- 2 — Ring structure, highly saturated, which imparts relatively low pour points, compared to straight chain fatty acids of equal molecular weight.
- 3 — Ring substituents, usually methyl groups. Positions of attachments are not accurately known

materials

pared from them for other uses.

Description: Sunaptic acids are naphthenic acids from Gulf Coast crude oils, and have been specially processed to a low unsaponifiable content. Chemically they are monocarboxylic derivatives of naphthenic hydrocarbons.

Grades B and C, with higher molecular weights and boiling ranges, are available for applications where low volatility is desired. Each grade is a mixture, therefore tests and properties shown in table represent an average of the components.

The petrochemical acids constitute a source of chemical intermediates for the synthesis of alcohols, amides, imidazoles, nitriles, and simple, partial, and complex esters. The sodium and potassium soaps of the acids are prepared by adding the acids to an aqueous solution of the alkali, and heating to 150-180°F until reaction is complete. Mixture is diluted to desired concentration. When dehydrated, soaps are somewhat plastic. When completely oil-free, they are friable solids with a marked tendency to absorb moisture.

Alkaline earth or heavy metal soaps are prepared by direct heating with metal oxides, hydroxides, acetates, etc, or reacting water-soluble metal soaps with water-soluble alkali Sunaptates. The heavy metal soaps find use when desirable properties are associated with the whole soap molecule rather than just the metal component.

(High MW naphthenic acids are marketed by Industrial Products Dept., Sun Oil Company, Dept. CP, 1608 Walnut St., Philadelphia 3, Pa. . . or for more information check CP 4470 on handy form, pages 2 and 3.)

Strong emulsifiers made by saponification of aminohydroxies

compounds are of interest
in chemical syntheses

Uses: Compounds have been successfully used in syntheses of resins, pharmaceuticals, dyestuffs, and photographic developers; as well as raw materials for textile specialties, drying oils, and synthetic resins.

Saponification with higher fatty acids makes unusually strong emulsifiers that find use in preparation of self-polishing floor waxes, cosmetic creams and lotions, textile specialties, cleaning compounds, and other types of wax, resin, or oil emulsions.

Features: Relatively high boiling points and low combining weights recommend their use for preparing water dispersions. Films deposited by emulsions are water-resistant after a short drying period, yet are easily removed by scrubbing with soap and water.

A specially refined diol for cosmetic preparations has superior stability with respect to color and consistency. Possessing no odor which might interfere with perfuming the final product, it forms creams which seem to be remarkably free from oil "leakage."

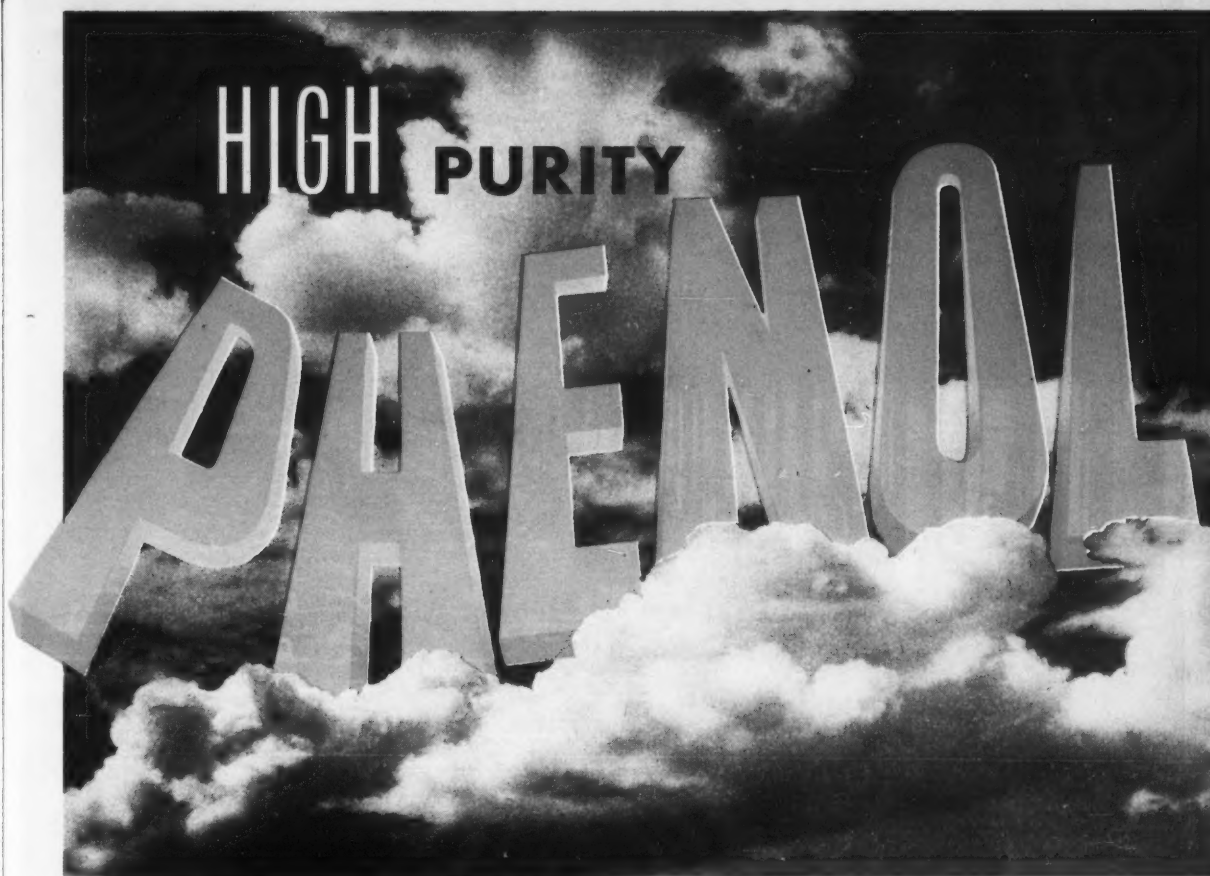
In syntheses, compounds form substituted amides with esters, anhydrides, and acyl halides. They also react with many other compounds including alkyl halides, aldehydes, ketones, and carbon disulfide. The substituted oxazolines are a group of compounds having surface-active properties.

Description: Aminohydroxy compounds 2-amino-2-methyl-1-propanol, 2-amino-2-methyl-1,3-propanediol, and tris(hydroxymethyl)aminomethane are available in commercial quantities. Other members of the series, 2-amino-1-butanol and 2-aminoethyl-1,3-propanediol, are still in the pilot plant stage. Chemical formulas and typical physical properties of these compounds include:

	Aminomethyl Propanol	Aminomethyl Propanediol	Tris (hydroxy- methyl) amino- methane
Formula	$H_2NC_2H_4OH$	$H_2NC_2H_4(OH)_2$	$H_2NC_3H_8(OH)_3$
MW	89.14	105.14	121.14
Boiling Point (°C @ 10mm)	165*	151-152	219-220
Melting point (°C)	30-31	109-111	171-172
pH (0.1 aq. soln. @ 20°C)	11.3	10.8	10.4
Solubility in water (gm/100 ml @ 20°C)	∞	250	80

*At 760 mm

(Aminohydroxy compounds are products of Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . check CP 4471, pgs. 2-3.)



The Oronite manufacturing process permits the consistent marketing of a highly pure Phenol. Exceeding the U. S. P. congealing point specification of 39.0° C, Oronite's guaranteed minimum is 40.6° C—with actual shipments being regularly higher. This dependable high quality, at competitive prices, suggests Oronite as a leading Phenol source.

Oronite, with complete control of all basic raw materials in its manufacturing process is truly a 100% *basic source* of supply. Thus with Oronite you are assured of a reliable Phenol source, service and product when you need it.

Contact any Oronite office for further product and supply information.

A partial list of Oronite Products

Detergent Alkane	Wetting Agents	Purified Sulfonate	Para-Xylene 95%
Detergent Slurry	Cresylic Acids	Polybutenes	Ortho-Xylene
Detergent D-40	Gas Odorants	Acetone	Xylol
Detergent D-60	Lubricating Oil	Naphthenic Acids	Aliphatic Acid
Dispersant NI-O	Additives	Phthalic Anhydride	Hydroformer Catalyst
Dispersant NI-W	Sodium Sulfonates	Maleic Anhydride	Fuel Oil Additives

Basic Chemicals for Industry

ORONITE CHEMICAL COMPANY

200 Bush Street, San Francisco 20, California • 714 W. Olympic Blvd., Los Angeles 15, California
30 Rockefeller Plaza, New York 20, New York • 20 North Wacker Drive, Chicago 6, Illinois
Mercantile Securities Building, Dallas 1, Texas

3263



When inquiring check CP 4472 on handy form, pgs. 2-3



Mathieson Chlorine: *worth its salt*

Row upon row of mercury cells characterize the uniform high purity of Mathieson chlorine. These cells decompose a salt solution by electrolysis to form a sodium amalgam and wet chlorine gas. Subsequent processes dry the gas, liquefy and cool it, resulting in chlorine approximately 99.9% pure. Above is one of five producing units from which Mathieson supplies quality chlorine to industries from Canada to the Gulf.

Consistent product quality is typical of all Mathieson chemicals. In addition, Mathieson offers consumers the protection of multi-plant production facilities . . .

3 major alkali plants, 7 sulphuric acid plants, 6 caustic soda plants, 3 ammonia plants . . . as well as practical technical assistance with chemical handling and application problems.

In planning your chemical requirements call in your Mathieson representative. Perhaps you can buy to better advantage from one of America's largest producers of basic industrial chemicals.

MATHIESON CHEMICALS
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.



CAUSTIC SODA • SODA ASH • CHLORINE • SULPHURIC ACID • SULPHUR • AMMONIA • NITRATE OF SODA • BICARBONATE OF SODA • NITRIC ACID • SULPHATE OF ALUMINA • SODIUM CHLORIDE PRODUCTS
ETHYLENE OXIDE • ETHYLENE GLYCOL • DIETHYLENE GLYCOL • TRIETHYLENE GLYCOL • POLYGLYCOLS • DICHLOROETHYLENE • ETHYLENE DICHLORIDE • METHANOL • SODIUM METHYLATE • ETHYLENE DIAMINE

MATERIALS

Makes effective antioxidant for rubber, waxes, plastics used in contact with food . . .

highly-purified, non-toxic agent has acceptance of Food & Drug Administration

Uses: As a non-toxic antioxidant for rubber products, especially those used in contact with food or other applications where health would be jeopardized by a toxic compound. Antioxidant is also effective in rubber-resin compositions, paraffin wax, plastics, and food packaging materials. In addition, it finds use as an antioxidant for fats, oils, cosmetics, and pharmaceuticals.

Features: Agent combines a high degree of efficiency with non-staining properties and freedom from toxicity. Even in applications where toxicity is of little importance, agent proves economically feasible.

Paraffin wax at paper-coating temperatures of 160-200°F deteriorates rapidly in color and odor. A sample containing 0.004% (by wt) of antioxidant developed no peroxides during 48 hr of aeration at 220°F. Control sample (without antioxidant) developed a peroxide number of 28 in the same test.

Solubility of agent in fats and oils is high, and it is virtually without odor or flavor. It is acceptable to Food and Drug Administration for use in stabilization of food and drugs and in materials coming into contact with such products.

Description: Ionol-CP is highly purified 2,6-di-tert-butyl-4-methylphenol, carefully refined to remove flavor and odor contributing contaminants. It is a free-flowing, white, crystalline solid, having the following specifications:

Purity (mol %, min)	99
Freezing point (°C, min)	69.4
Color (Pt-CO of a 10% soln. in IPA, max)	15
Ash (wt %, max)	0.002

(Non-toxic antioxidant is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N.Y. Check CP 4474, pages 2 and 3.)

Lists properties of laminations made with line of adhesives

Illustrated 12-page bulletin features list of adhesives for twenty-six laminating materials, and another showing applications of completed laminations and properties in the laminate that are usually needed.

Manual #110 is issued by Dept. P, Rubber & Asbestos Corp., Dept. CP, 225 Belleville Ave., Bloomfield, N.J. When inquiring specify CP 4475 on handy form, pages 2 and 3.

When inquiring check CP 4473 on handy form, pgs. 2-3

MATERIALS

Reported as minor nutritional factor, and lipotropic agent for treatment of liver, cardiovascular disorders . . .

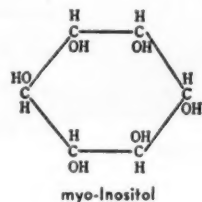
inositol is also recognized as a growth factor for microorganisms

Uses: As an ingredient in multivitamin preparations and as a lipotropic agent for treatment of liver and cardiovascular disorders. Other applications being investigated are in geriatric products, and in treatment of alcoholism, diabetes, and obesity. Several chemical derivatives have also attracted interest in a number of pharmaceutical applications.

Features: Compound has been recognized as a member of the vitamin B complex, and is reported as a minor nutritional factor. Evidence also indicates that it is a growth factor for yeast and other microorganisms.

Ability of compound to prevent formation, and to facilitate removal of excess fat in the livers of experimental animals was reported in 1941. Subsequent work has shown that it is related to the metabolism of fat and cholesterol in the animal body, although exact nature of the relationship is not known.

Description: Inositol is supplied as a white, crystalline powder, having no odor. Molecular weight is 180.16, and its chemical structure may be likened to a cyclized form of glucose in which the aldehyde group has been changed to a secondary alcohol group.



Compound is soluble in water, slightly soluble in alcohol, and insoluble in other organics. Melting point is 225°C. Inositol is neutral and non-hygroscopic.

(Inositol is a product of Chemical Div., Corn Products Sales Co., Dept. CP, 17 Battery Place, New York 4, N. Y. . . . or for more information check CP 4476 on handy form, pages 2 and 3.)

Looking for a chemical raw material or intermediate? . . .

The alphabetical Product Directory (pages 170 to 173) will help you find it in a hurry. This listing, started by **CHEMICAL PROCESSING** in 1938, "puts the finger" on all subjects and products in editorial columns and advertisements of each issue.

can you use powdered Na for

- PURIFYING HYDROCARBONS AND ETHERS**
- FINELY DIVIDED METALS AND CATALYSTS**
- YOUR PROCESS**

Atomic layers of metallic sodium can be coated on the surface of finely divided solids such as salt, soda ash, carbon, alumina, metal oxides and sand. The coated solids are free-flowing, can be used in fixed beds or fluidized systems, or can be suspended in hydrocarbons. The amount of sodium present depends on the particle size of the carrier, e.g., carbon black carries over 35%.

The tremendous surface-to-weight ratio of sodium provides complete and rapid reaction at temperatures above and below sodium's melting point. This easily-handled, easily-controlled form may be your answer to problems such as:

1.—Reduction of metal salts, Ti, Zr, Fe, Pb, Zn, Cu, Ni, Pt, etc.

2.—Purification of gases, hydrocarbons and ethers.

3.—Preparation of NaH and NaNH₂ for in situ use.

4.—Catalyst for hydrocarbon cracking, polymerization and rearrangement reactions.

Although sodium coated solids can be handled safely in air, they should be prepared and used in closed systems to obtain high yields. High surface area is the key to the efficiency of sodium in this form. Hence, the title for our booklet "High Surface Sodium". **A copy is yours for the asking.**

We supply sodium in brick form, cast solid in drums and in tank cars and offer technical assistance on its use.

U.S.I.

Metallic Sodium is manufactured by
National Distillers Chemical Co.
at Ashtabula, Ohio and sold by:

INDUSTRIAL CHEMICALS CO.

Divisions of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y. Branches in principal cities



PLEASE SEND ME INFORMATION ON SODIUM FOR _____

NAME _____

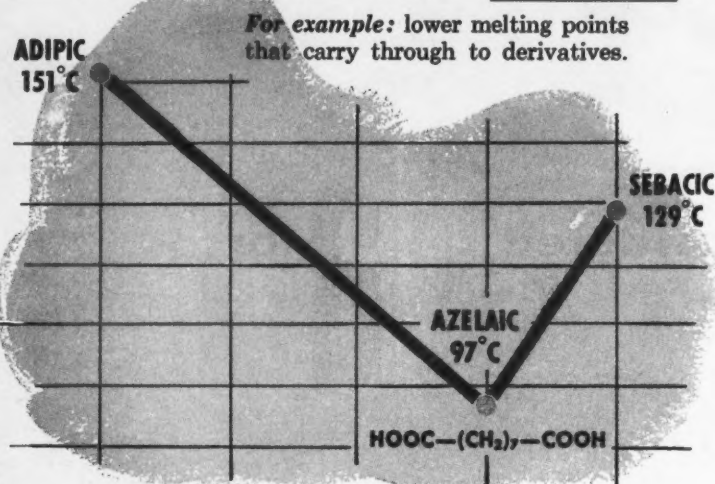
COMPANY _____

ADDRESS _____

When inquiring check CP 4477 on handy form, pgs. 2-3

THE O_D^D CARBON...

makes Azelaic Acid different



check the difference:

	ADIPIC	AZELAIC	SEBACIC
Carbon Atoms	6	9	10
Molecular Weight	146	188	202
Melting Point, °C	151	97	129
Boiling Point, °C at 100 mm.	265	286	294
Water Sol. at 20°C, G/100 gm H ₂ O	1.44	0.24	0.10
M. P. of Amides, °C	220	175	210
M. P. of Anilides, °C	235	185	198
Freezing Point of 2, ethylhexyl esters, °F*	-15	-49	-8
Freezing Point of 3, methylbutyl esters, °F*	-90	-110	-67
Freezing Point of 2, ethylbutyl esters, °F*	-44	-53	+1

*Bried, E. M., et al., Ind. Eng. Chem. 39: 484 (1947)

This unique melting point behavior of EMEROX® Azelaic Acid is but one example of how its odd carbon chain length makes azelaic acid different from other commercial dibasic acids. And since these differences are reflected by end-products, azelaic acid may give your product a competitive advantage ...or it may fit into your development program as a new dibasic acid from which to build unique products.

Write Dept. CP-1 today for descriptive literature or a sample of Emerox Azelaic Acid.



EMERY INDUSTRIES, INC.
Carew Tower, Cincinnati 2, Ohio

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

New York • Philadelphia • Lowell, Mass.
• Chicago • San Francisco • Cleveland
Warehouse stocks also in St. Louis, Buffalo,
Baltimore and Los Angeles.

Export 5035 RCA Bldg., New York 20, N. Y.

MATERIALS

**Strong resin-to-metal adhesion
provides absence of corona
in high voltage uses . . .**

clear epoxy resin series has low shrinkage,
good electrical properties

Uses: For potting, impregnating, or laminating
work, and in encapsulating electrical components.

Features: Castings made from the compounds
are superior in high voltage applications due to
absence of corona because of their exceptional
adhesion to metal. Resins have very low shrinkage
and good electrical properties.

Description: C-Series clear epoxy resins are
supplied as liquids and without filler content. Com-
bined with different chemical activators that are
available, various characteristics can be imparted
to formulations. Filler materials such as glass,
asbestos, silica, alumina, or metal powders can be
incorporated with the resins to lower costs and obtain
mechanical properties or viscosities to meet specific
requirements.

(Epoxy resin series is a product of Armstrong
Products Co., Dept. CP, PO Box 1, Warsaw, Ind.
Check CP 4479 on the handy form, pages 2 and 3.)

**When hot-formed, sheet plastic
retains shape, resists crazing
due to strain or solvents**

Uses: As a sheet plastic which can be hot-
formed.

Features: Sheet possesses 19 times the abrasion
resistance of acrylic, and is totally resistant to
crazing due to strain or solvents. When hot-formed,
material retains curvature, and does not exhibit
any snapback or flattening out due to plastic mem-
ory.

Description: Called CR-39M, plastic sheet has
following characteristics:

Tensile strength (psi)	8400
Flexural strength (psi)	14,700
Compressive strength (psi)	24,600
Impact strength, Izod notched (ft lb/in)	0.3
Abrasion resistance, Taber (times methacrylate)	19
Heat distortion (mils @ 130°C)	105
Water absorption (after 24 hr @ 25°C, %)	0.2
Acetone absorption (after 7 days @ 25°C, %)	1.9

Standard size sheets are 36 x 48" to 60 x 60", in
thicknesses ranging from 0.020" to 0.500".

(Sheet plastic is a product of Cast Optics Corp.,
Dept. CP, 1 Post Rd., Riverside, Conn. . . or
check CP 4480 on handy form, pages 2 and 3.)

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Fatty Acids
and Methyl Esters

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For samples and specifications, write
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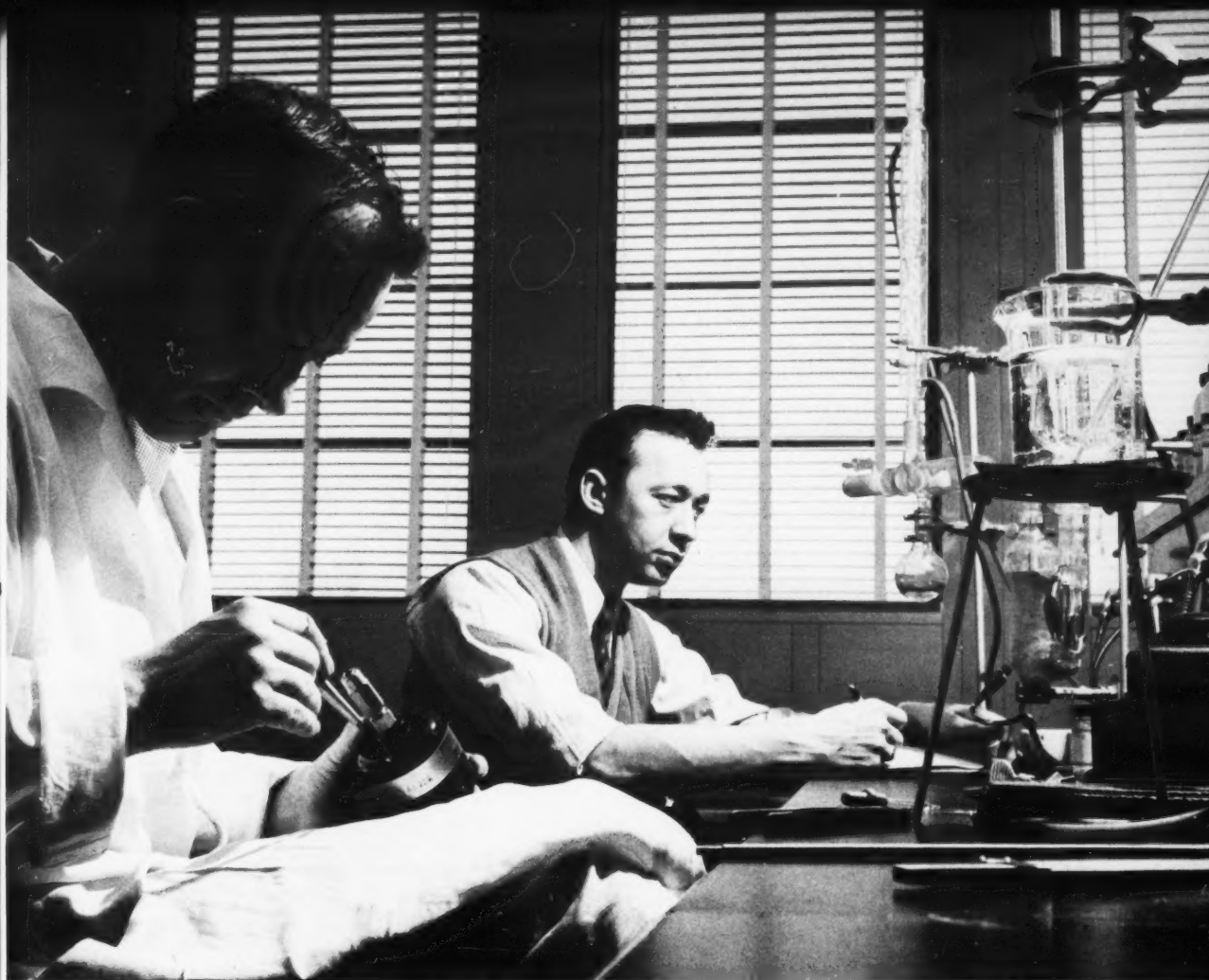
Main office:
PO Box 599, Oakland 4, Calif.

Plants:
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 4481
on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 4478 on handy form, pgs. 2-3



Only a thorough evaluation can give you the full scope of the Pluronics' benefits. Pictured here is a test to determine the cloud point of nonionic surfactants, and a check on the melting point of Pluronic F-68 . . . first 100%-active nonionic commercially available in flake, powder or solid form.

Report on Wyandotte Pluronics*

What's new about the Pluronics?

The Pluronics are a new series of 100%-active nonionic surface-active agents, based on a chemical concept not previously used in the synthesis of nonionic surfactants. They provide an over-all balance of desirable properties: ease of formulation, stability, controlled sudsing, a range of surface-active properties, low hygroscopicity, dedusting properties, and a low order of toxicity.

The unusual flexibility of the Pluronics make them especially interesting . . . it is possible to prepare a Pluronic to meet any requirement of molecular weight or hydrophilic-hydrophobic balance, within the established range.

What's different about them?

The Pluronics are the first commercial example of a block-polymer-type surface-active agent . . . made from a hydrophobic polyoxypropylene base with hydrophilic polyoxyethylene groups attached to either end. This use of polyoxypropylene as the hydrophobic portion of the molecule is unique, the secret being to build a polyoxypropylene chain long enough to be water insoluble. The hydrophobic base may be varied in molecular weight, and any percentage of the hydrophilic groups can be added. The Pluronics range in molecular weight from 1800 to 8000. This compares with the usual range in molecular weight for surface-active agents of from 300 to 700.

(CONTINUED ON NEXT PAGE)

*REG. U.S. PAT. OFF.

What about formulating?

Pluronics are easy to formulate . . . you can choose from liquid, paste, flake, powder or solid-cast. Liquid Pluronics can be spray-blended by special spray systems, an ordinary sprinkling can, or nail-punctured drums suspended above mixing apparatus. Pluronics blend easily with common builders; permit you to compound a quality product using only solid materials.

Where are Pluronics used?

The Pluronics are already in commercial use in water conditioning, in the manufacture of viscose rayon and cellophane, in dye leveling, shampoos, boiler-water compounds, mechanical - dishwashing compounds, home and laundry detergents, and in metal-cleaning formulations. Promising new applications are being reported continually. The Pluronics have a wide range of characteristics. For example, L62 is a good wetting agent . . . F68 is an excellent dispersing agent . . . L64 combines a balance of wetting, dispersing and emulsifying characteristics that make it exceptionally effective as a detergent. These characteristics give the Pluronics unique advantages over other surface-active agents. They merit your full and careful evaluation. Brief summaries of a few of their uses are given here.

★ ★ ★

Flexibility of Pluronics helpful in metal cleaning

The field of metal cleaning is unusually complex, due to the many variables in the type of cleaning, the types of metals to be cleaned, types of soil to be removed, and the processing that metals are to receive after cleaning. Most metal-cleaning operations, therefore, require a cleaning compound designed to fit the particular process.

The Pluronics have proved especially valuable in metal-cleaning formulations for a number of reasons.

Most important, perhaps, is their exceptional flexibility. With the Pluronics, you can tailor the product to meet your precise needs.

The Pluronics are stable and effective over the entire range of pH, in both acid and alkaline solutions. The suds range of the Pluronics is wide — from no foam to moderate foam. You can choose a Pluronic, or combination of the Pluronics, with the exact sudsing characteristics you require. Another important benefit: in electrocleaning, the controlled sudsing properties of the Pluronics preclude excessive hydrogen entrapment and reduce explosion hazards.

Test the Pluronics thoroughly . . . use the coupon for more information.

The Pluronics control suds in laundry detergents

Large-scale makers of laundry detergents have recently introduced compounds containing one or more of the Pluronics. Why? Because they found that the Pluronics, with their over-all balance of desirable properties, are the most versatile agents of their type available today.

Some of these properties are: controlled sudsing, ease of formulation, stability in solution, compatibility with a wide variety of materials, high detergency, and permanent dedusting effect with no moisture pickup.

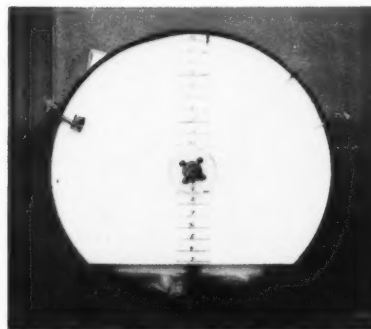
Pluronics' inherent flexibility makes it easy to formulate compounds with optimum characteristics. Suds level, carbon soil removal and whiteness retention can be varied easily to suit particular requirements.

Perhaps the Pluronics could give your product the same market advantage. Why not investigate today?

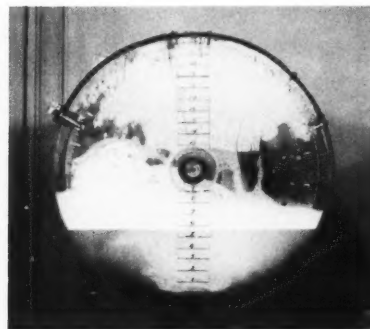
Pluronics important in water treatment

Commercial usage by major producers of boiler-water compounds has proved the Pluronics to be one of the most valuable recent developments in the industry.

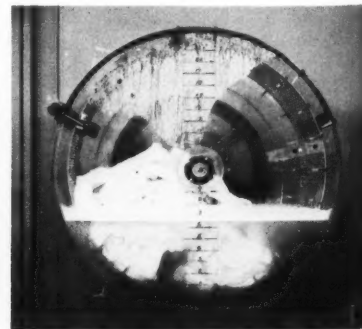
Compare suds levels of home detergents



High-sudsing property of typical popular detergent.



Action of low- or "controlled-sudsing" popular detergent.



Very low sudsing of new detergent containing Pluronics.

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Pluronics control suds in dishwashing

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There are two main reasons for this: 1) their foam depressing characteristics, and 2) their exceptionally effective dispersing power for calcium and magnesium salts. Other properties of the Pluronics that have proved beneficial in boiler-water treatment, as well as in some water-conditioning applications, are: their compatibility and stability with acid or alkali solutions over a wide temperature range, and their unusually low order of toxicity.

Are these *your* requirements for a surface-active agent? . . . for more information, use coupon below.

Pluronics improve mechanical-dishwashing compounds

Nowhere have the Pluronics played a more dramatic role than in the mechanical-dishwashing field. Here they found an almost immediate acceptance, due to their unique combination of desirable properties. The most important are:

1. An ability to eliminate staining and streaking usually caused by improper rinsing.
2. Exceptional low-foaming properties.
3. Better, more permanent dedusting effect than other surface-active agents.
4. No increase in the hygroscopicity of the compound.

No other single nonionic surfactant can duplicate this unique combination of desirable properties. Formulators using the Pluronics in their mechanical-dishwashing compounds have a distinct product advantage—a product advantage that pays off in a distinct sales advantage.

If you manufacture mechanical-dishwashing products, you should investigate the Pluronics thoroughly . . . use coupon below for further information.

What about stability?

The Pluronics are stable in both acid and alkaline solutions, even at elevated temperatures. Moreover, their surface-active properties remain relatively constant over the entire range of pH. Since the Pluronics are not precipitated by calcium or magnesium ions, their detergency performance in formulated products remains relatively uniform, regardless of the water hardness.

What about sudsing?

The Pluronics series offers a wide range of foaming properties, enabling you to choose a particular Pluronic with exactly the sudsing characteristics you require. Pluronics L61 and L62 are essentially non-foaming, generating less foam than any other commercially available surfactant.

Pluronics L64 and L68 generate moderate foams, making them particularly useful in those applications where foam is desirable.

Pluronic L61 can be used effectively to depress the foam of any of the other Pluronics.

What about dispersing power?

Pluronic F68 and Pluronic L64 are exceptionally effective dispersing agents for calcium and magnesium salts. The Pluronics, by keeping these inorganic salts in suspension, reduce the amount of adherent hard water deposits in boilers and pipes when used in water-treating compounds. The use of the Pluronics also renders the scale that does precipitate softer and more easily removed, due to the Pluronics' rewetting effect.

(CONTINUED ON NEXT PAGE)

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Wyandotte Chemicals Corporation
Attention: Advertising Dept.
Wyandotte, Michigan



What about rinsability?

The Pluronics provide maximum effectiveness as rinsing agents, in proportions as low as 2%. Laboratory evaluations, field tests and established commercial usage have shown the Pluronics to be superior in the promotion of free-rinsing — especially valuable in the mechanical-dishwashing field.

Staining and streaking due to improper rinsing have been decreased by as much as 90% by the inclusion of a very small amount of the Pluronics in mechanical-dishwashing compounds.

What about dedusting?

The dedusting effect of the Pluronics is much more permanent than that of many other surface-active agents, yet products incorporating the Pluronics remain free-flowing.

The liquid Pluronics, even at concentrations as low as 0.5% by dry weight of the formulation, are effective dedusting agents. They dedust not only during the compounding operations themselves, but also the finished product.

Compounders report that many dedusting agents lose their effectiveness after a period of time, whereas the use of half as much Pluronics gives effective permanent dedusting. This superiority is believed to be due to the much higher molecular weight of the Pluronics. They have no tendency to migrate.

What about hygroscopicity?

One of the problems of using anionic surface-active agents is the rapid increase of hygroscopicity in pro-

portion to active-agent content. This hygroscopicity is also quite apparent in many of the nonionics.

An unusual feature of the Pluronics is their low order of hygroscopicity. Not only are the Pluronics relatively nonhygroscopic themselves, but they actually decrease the hygroscopicity of other components of formulations in which they are used.

For samples and more information . . .

The Pluronics make it easy to formulate products with optimum characteristics, products that are completely dust-free, non-caking, and exceptionally free-flowing, products with distinct advantages over competition. Evaluate them as a basis for an entirely new approach in formulating . . . the Pluronics may be the key to compounding concepts that open up new avenues of progress for your company. *But only a thorough evaluation can give you the full scope of the Pluronics' benefits.* For samples of the Pluronics, data sheets summarizing their physical and surface-active properties, and other technical and price information — call your Wyandotte representative or mail the coupon today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

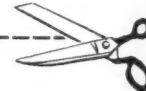


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CHEMICALS

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tural Insecticides • Other Organic and Inorganic Chemicals

MAIL THIS SELF-ADDRESSED POST CARD FOR DATA AND SAMPLES.



Wyandotte Chemicals Corporation, Wyandotte, Michigan

Please send:

- ☐ Data on the use of Pluronics in metal-cleaning formulations
- ☐ Samples of Pluronics L61, 62, 64, F68 for metal-cleaning products
- ☐ Data on the use of Pluronics in home and commercial laundry detergents
- ☐ Samples of Pluronics L44, 61, 62, 64, P75, F68 for laundry detergents
- ☐ Data on the use of Pluronics in water-treating applications
- ☐ Samples of Pluronics L61, 64, F68 for water-conditioning compounds
- ☐ Data on the use of Pluronics in mechanical-dishwashing compounds

- ☐ Samples of Pluronics L61, 62, F68 for dishwashing products
- ☐ Have a Wyandotte representative call on me.
- ☐ Data on Pluronics for _____

_____ application

Name _____

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Remains clear and free-flowing down to 32°F, is neutral and highly stable . . .

wetting agent is unaltered by acids, alkalis, and oxidizing and reducing agents

Uses: As a synthetic detergent and wetting agent in textile, paper, leather, cosmetic, and cleanser manufacturing.

Features: Product is neutral in reaction and exhibits high stability to acids, alkalis, hard water, and oxidizing and reducing agents. It remains clear and free-flowing at temperatures as low as 32°F, eliminating need for applying heat to stock solutions or storage tanks unless temperature is likely to be lower than 32°F.

Description: Nacconol SL is a liquid anionic synthetic organic detergent of the alkyl aryl sodium sulfonate type. It has the following physical and chemical properties:

Sp gr (@ 68°F)	1.06
pH	6.5-7.5
Haze point (°F)	<32
Active organic content (% min)	35
Foaming power	Excellent
Odor	Faintly aromatic

(Wetting agent is a product of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. . . or for more information check CP 4482 on handy form, pages 2 and 3.)

Pair designed for beater dyeing in paper trade . . .

both colors are bright green-shade yellows

Uses: Characteristics are suitable for beater dyeing napkin and tissue grade papers.

Features: Dyes are alkali-resistant and non-feathering, and produce more uniform paper. Good color value is obtained in cold water in quick pulping equipment.

Description: Pheno Fast Yellows 8G and 6G are bright green-shade yellows. The 8G is an extremely green-shade yellow.

(Yellow dyes are products of Dyestuff Dept., American Cyanamid Co., Dept. CP, Bound Brook, N.J. . . or for more information check CP 4483 on the convenient Reader Service slip which is located between pages 2 and 3.)

For more information on product advertised at left, specify CP 4484 . . . see information request blank between pages 2 and 3.

Your Imagination and Polyamide Resins Can Do Almost Anything



● General Mills Polyamide Resins are now among the most versatile of all chemical "ingredients." They are used in processing or formulating a remarkable range of products from shoes to fire retardant paints. They improve performance characteristics of glass laminates, foil coatings, papers, plastic films, modeling waxes, overprint varnishes, pottings and castings—to name a few. Nobody yet knows the total extent of their uses in cost-saving product improvement.

Have you a product that needs greater impermeability or better adhesion, more toughness or better wearing qualities? Consider the application of these versatile resins. Their narrow and highly controllable melting points, and the controllability of heat seal temperatures and hardness through blending of high and low melting point Polyamide Resins, add to their range of uses.

Polyamide Resins make excellent thermoplastic adhesives because they heat seal easily, bond at moderate temperatures, and set almost immediately. In addition, they are non-blocking, and have good heat and color stability. They are resistant to oils, commercial antifreeze, wax emulsions, detergents and other solvents, water and grease.

We'll be glad to work with you in developing any new adaptation of Polyamide Resins to solve a specific problem.

For detailed information, please send the coupon below.

We also manufacture a complete line of Fatty Nitrogen Compounds and Fatty Acids.

From Wheaties to industrial chemicals was not a big step for General Mills. The "know-how" that produced Wheaties played a large part in developing Polyamide Resins and other chemical products.

PROGRESS THRU RESEARCH

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KANKAKEE, ILLINOIS

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When inquiring check CP 4485 on handy form, pgs. 2-3



for Chemical Processing Advertisers*

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It signifies that CHEMICAL PROCESSING has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our C.P. executive staff includes a past president of NBP and a member of its Board of Directors.)

But belonging to NBP is more than a feather in our publishing cap. It's an important *plus* for every advertiser in CHEMICAL PROCESSING. Here are the membership requirements. Judge for yourself:

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- Periodic audit of circulation
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In addition, NBP provides the framework for a continuing exchange of ideas among member publishers. The result: continuing improvement in publishing practices to make CHEMICAL PROCESSING more useful to its readers . . . more productive for its advertisers.

* Courtesy of the publication MEDICAL ECONOMICS, creator of this copy, here adapted to CHEMICAL PROCESSING.



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For men who manage
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square, high-visibility format; quality readership;
hence more READER ACTION



MATERIALS

**High tear strength, resilience
shown by lightweight
rubber webbing . . .**

water-repellent product is capable of breathing,
should find many uses

Specially made rubber webbing shows such high tensile strength that it may be sewn, tacked, stapled and cut at the edge without forming a running tear.



"Abercrombie is a do-it-yourself-man — expanding his rubber-web house before stork's arrival"

It also shows high porosity, low density, and high resilience.

Product consists of a web formed of a number of small rubber fibers in random distribution, which are bonded together at their point of contact. Called Filastic, the web is formed by milling natural or synthetic rubber with conventional curing agents now in use.

The composition is dissolved in a volatile solvent and extruded as a stream into a rapidly moving column of air. Air blast disrupts the rubber stream to form numerous fibers which are blown upward and deposited on a moving screen. The layer which is formed is talced and cured.

Rubber is expected to find many industrial uses, such as cushion innersoles for shoes, carpet pads, elastic bandages and wearing apparel. Web is water-repellent, but capable of breathing.

(Development work for high-tensile rubber web was done in the laboratories of Arthur D. Little, Inc., Dept. CP, Cambridge 42, Mass., under a project financed by American Viscose Corporation, Department CP, 1617 Pennsylvania Boulevard, Philadelphia 3, Pennsylvania . . . or for more information reader may simply check CP 4486 on convenient Reader Service slip which is located between pages two and three.)

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MATERIALS

Ethylene diamine tetraacetonitrile

Uses: As a chemical intermediate, exhibiting the typical reactions of nitriles.

Features: Polynitrile structure makes compound an interesting intermediate for polyamino derivatives. Readily hydrolyzed with dilute alkalis or acids, it reacts with alcohols to give long chain esters. Compound can be reduced readily, and undergoes Friedel-Craft reactions. It forms quaternary compounds and many complex derivatives.

Description: Ethylene diamine tetraacetonitrile (EDTN) is a cream to light tan powder having a purity of 95% (min). Melting range is 131-133°C. The pH of a 2% solution is 4-6.

Compound is soluble in hot water, methanol, and ethyl acetate. It is practically insoluble in cold water, hydrocarbons, and vegetable and mineral oils.

(EDTN is a product of Glyco Products Co., Inc., Dept. CP, 26 Court St., Brooklyn 2, N. Y. . . . or for more information check CP 4487, pages 2 and 3.)

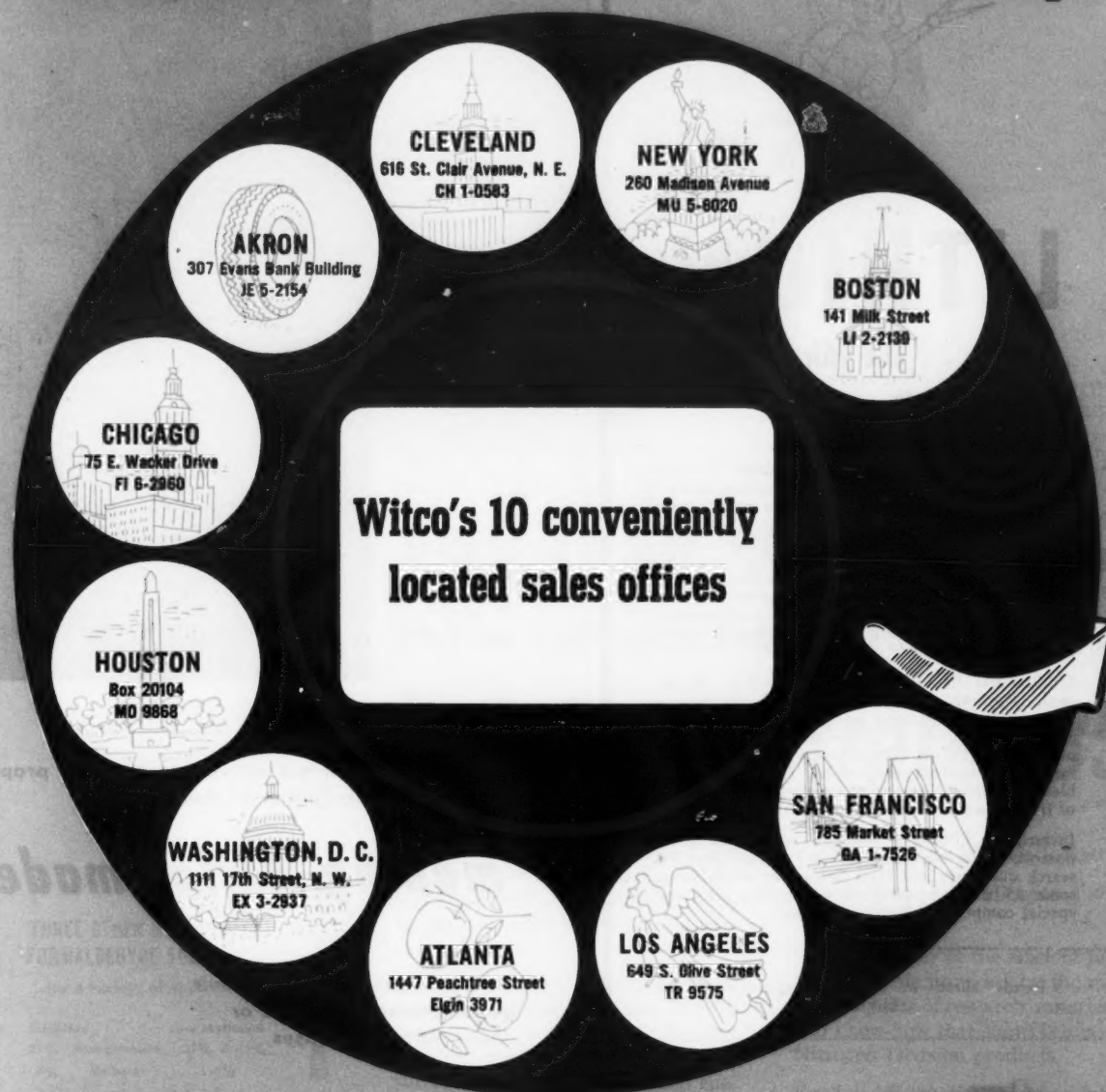
Diatomaceous earth as filter aids

Producing a thick, porous cake for pressure filtering, manufacturer's Filt-R-Fast diatomaceous earth filter aids are covered in pocket-size folder. Grades available, analyses, suggestions for using, and summary of applications are presented.

Bul No. 334-1 is issued by Westvaco Chemical Div., Food Machinery & Chemical Corp., Dept. CP, 161 E. 42nd St., New York 17, N.Y. When inquiring specify CP 4488, pages 2 & 3.

For more information on product at right, specify CP 4489 . . . see information request blank between pages 2 - 3.

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Element

Lithium has made the world its market. To supply that market, Lithium Corporation has assured itself a supply of spodumene ore, the most plentiful and economic lithium raw material, sufficient for years to come. To meet industry's demands for more Lithium products, we are doubling our metal-making capacity and greatly increasing overall production. A new research and development laboratory will continue to develop new and improved uses for Lithium chemicals for the benefit of all industry.

Lithium has found a permanent place in the organic chemical, ceramic, metallurgical, pharmaceutical, grease and atomic energy fields. Lithium is a valuable additive in glassware and pottery, vitamins, welding flux, optical lenses and prisms, cosmetic cream, storage batteries, varnish, candles, bleaches, signal flares and television tubes. Many of its uses were unheard of a year or two ago.

Investigate Lithium's unusual, sometimes paradoxical, often uniquely valuable properties. Research quantities and Data Sheets are available on some 25 different products — metals, salts and special compounds. Write for them.

... trends ahead in industrial applications for
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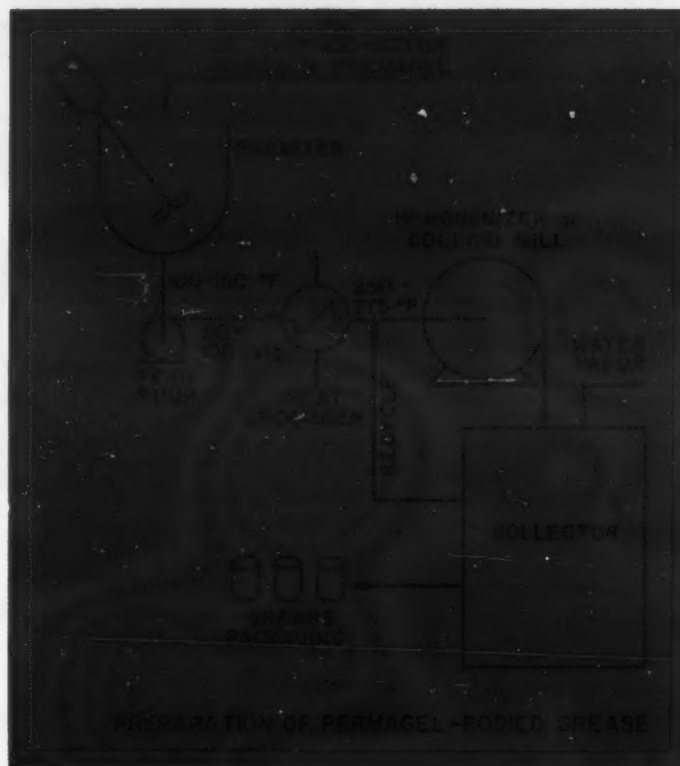
Mines:

Black Hills, South Dakota, Bessemer City, North Carolina, Manitoba
and Quebec.

Plants:

St. Louis Park, Minn. and Bessemer City, North Carolina

materials



Thickener and surface-active agents, when properly
dispersed in lubricating oil, facilitate —

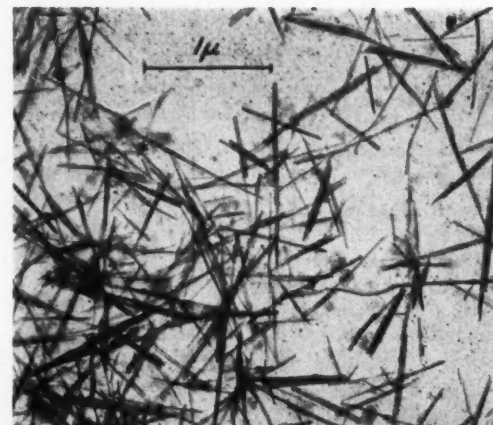
making tailor-made greases

Formulas can be varied to suit
requirements of specific or
multi-purpose greases

When thickener, a purified colloidal form of attapulgite, is properly dispersed in lubricating oils, finished greases can be pumped at low temperatures, have no melting or dropping points, are stable to mechanical shear, are resistant to washing action of water, and can absorb more than their weight of water without change in consistency. Formulations can be varied to permit production of tailor-made grease to suit either specific or multi-purpose requirements.

Procedure

Procedure for making greases involves subjecting a mixture of oil, thickener (called Permangel, see *CHEMICAL PROCESSING*, Nov., 1953, p. 44), and a



Electronmicrograph of Attapulgite shows needle-like
particle structure

When inquiring check CP 4490 on handy form, pgs. 2-3

surface-active agent in proper amounts to intense shearing action at temperatures above 212°F.

Equipment consists of a heating system for bringing ingredients to a temperature of 250-275°F, and a close-clearance colloid mill or high pressure homogenizer. Prime consideration in gaining proper dispersion and a satisfactory grease structure is applying high shear and simultaneously vaporizing free moisture from the Permangel.

Heating system can be either a combination of an open kettle or other premixer, a pump, and a heat exchanger; or a jacketed pressure kettle. Open kettle temperature should not exceed 190°F as free moisture might be prematurely lost. Homogenizer feed pressure should be high enough to assure uniform operation and prevent vapor formation on suction stroke.

Dispersion is achieved through shear and impact developed as pressure is released through homogenizer valve. Rapid release of free moisture is a major factor for good dispersion. One to three passes effects complete dispersion.

Selection of Surface-actives

Judicious selection of surface-active agents gives required dispersion, permits control of grease properties, and makes it possible to obtain optimum gel in a variety of oils. Permangel-bodied greases with specific or multi-purpose properties are thus possible.

Cationic, non-ionic, or anionic agents can be used. They must have low water solubility to produce greases of high water resistance. Also, they must resist thermal decomposition and oxidation. Optimum amounts run 22-30% (by weight) of Permangel, depending upon particular surface-active agent used.

Combinations of these agents often give synergistic effects. For example, Armour's Ethomeen 18/15 or Atlas' G-3825 used in combination with Victor Chemical's Victamine C gives excellent greases that have improved mechanical stability. One formulation combines 12% (by wt) Permangel with 1.2% Victamine C and 1.9% Ethomeen 18/15 or G-3825.

(Permangel colloidal attapulgite for grease is a product of Attapulug Div., Mineral & Chemical Corp. of America, Dept. CP, 210 W. Washington Square, Philadelphia 5, Pa. Check CP 4491, pages 2 and 3.)

Specs, reactions, and applications of glacial methacrylic acid

Typical physical properties and specifications, reactions including polymerization and copolymerization, and applications of glacial methacrylic acid are thoroughly covered in 14-page monograph.

Bul SP-88 is issued by Special Products Dept., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. When inquiring specify CP 4492 on handy form, pages 2 and 3.



water is costly!

squeeze it out of your resin production picture with U.F. Concentrate-85

THREE OTHER HIGH PURITY FORMALDEHYDE SOLUTIONS

...for a variety of applications

Inhibited	Low Methanol
37%...Formaldehyde...	37% & 45%
7%...Methanol	1.5%
3.5.....pH	3.5

As with all Nitrogen Division Products, these exceed the specifications of most industrial users.

U.F. Concentrate-85 is the highest concentration of liquid formaldehyde commercially available...61% formaldehyde and 24% urea in a water solution!

... Here are 4 big reasons why you should use U.F. Concentrate-85 for the synthetic resins used in making molding powders, textile finishes, surface coatings, adhesives and special papers:

- Increase production in shorter time with existing equipment.
- Reduce processing time for dehydration.

- Charge larger batches to kettles.
- Save storage, handling and shipping costs.

This is another of the efficient process chemicals provided by the more than 60 years of research, experience and know-how that stand behind all Nitrogen Division products.

For full information and free folder on U.F. Concentrate-85, or other formaldehyde solutions, write today!



NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Hopewell, Va. • Ironton, Ohio • Orange, Tex. • Omaha, Neb.

Anhydrous Ammonia • Ammonia Liquor
Ammonium Sulfate • Sodium Nitrate
Urea • Ethylene Oxide • Ethanolamines
Ethylene Glycol • Diethylene Glycol
Methanol • Formaldehyde
Nitrogen Tetroxide
U. F. Concentrate-85
Nitrogen Solutions
Fertilizers & Feed Supplements

When inquiring check CP 4493 on handy form, pgs. 2-3.



Industry counts on Heyden ... as a dependable source of organic chemicals

For more than 50 years Heyden has been supplying organic chemicals to almost every process industry you can mention. These products have grown steadily in number, volume and applications, and are known for their high standards of quality and dependability. We believe this is a direct result of

our continuing research, exacting technical control, and advanced manufacturing methods.

Heyden organic chemicals comprise both aliphatics and aromatics, which include large volume basic raw materials for many important fields:

- **Formaldehyde** (Hexamethylenetetramine, Paraformaldehyde) for plastics, textiles, leather and chemicals
- **Pentaerythritols** (Pentek®, Mono-, Di-, Tripentek®) for paints and varnishes
- **Salicylic Acid and Salicylates** for drugs, odorants, dyes, resins
- **Chlorination and Oxidation Derivatives of Toluene** (Benzyl Chloride, Benzaldehyde, Benzoic Acid) for dyes, sanitizers, drugs and cosmetics
- **Other Organic Intermediates** for a wide variety of products

*Write to us now for further information on Heyden chemicals.
We shall welcome the opportunity to work with you.*

HEYDEN CHEMICAL CORPORATION

342 Madison Avenue, New York 17, N.Y.

CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA
PROVIDENCE • SAN FRANCISCO

MATERIALS

Silicone rubber coating for synthetics improved

Uses: As a coating for synthetic fabrics and glass cloth, such as shipboard cable tape.

Features: Coating has improved crease-resistance and retains its dielectric strength in service. Less sensitive to processing temperatures than comparable silicone rubbers, coating cures well over a wide range of temps.

Description: Improved silicone rubber coating retains the name, price, and basic properties of Silastic 132, the compound it replaces. Sample 10 mil coating on ECC 116 heat-cleaned glass cloth kept original average tensile strength of 140 lb/in lengthwise unchanged after four creases. After aging 96 hr @ 200°C, lengthwise average was 145 lb/in, uncreased; 95 lb/in after four creases.

Similarly coated samples held a dielectric strength of 1100 vpm after 21 days @ 250°C. Coating is commercially available in 100% solids form, or as a 35% dispersion in xylene.

(Silicone rubber for coating is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . . or for more information check CP 4494 on handy form, pages 2 and 3.)

Details suspensoids of polyamide resin

Suspensoids are specially prepared dispersions of polyamide resins in water, used in protective coatings and sealants for rubber and leather.

Bul 11-5-1 is issued by General Mills, Inc., Dept. CP, 2010 E. Hennepin, Minneapolis 13, Minn. When inquiring specify CP 4495 on handy form, pages two and three.

For more information on product at left, specify CP 4496 . . . see information request blank between pages 2 - 3.

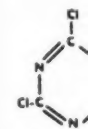
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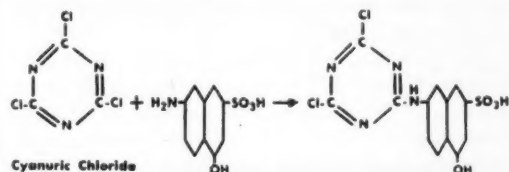
In condensation or replacements, cyanuric chloride reacts without formation of isomers . . .

high purity intermediate finds many applications in chemical field

Uses: A valuable intermediate in the manufacture of dyestuffs, optical brighteners, insecticides, tanning agents, plasticizers, and wetting agents.

Features: High purity compound has three reactive chlorine groups which may be used for single, double, or triple condensations or replacements. Specific compounds can be produced without the formation of other compounds or isomers.

When more than one molecule of the intermediate is wanted in a compound, they can be linked together through an aliphatic or an aromatic diamine, or an aliphatic or an aromatic di mercaptan. It can also be accomplished by first placing an



amine group in the molecule (see equation) and then reacting this with an aliphatic or aromatic dichloride.

Description: Cyanuric chloride as available is 99% pure (min), determined by sublimation. Residual after sublimation is 0.5% (max). Melting point is $145.7 \pm 0.1^\circ\text{C}$. The yellow to off-white compound has a pungent odor.

Chlorine replacement is in a progressive manner. One chlorine is replaced at $0-15^\circ\text{C}$; the second, at $40-50^\circ\text{C}$; and the third, at 80°C to refluxing temperature. Most reactions are performed with the compound as a finely divided suspension in water. To prepare suspension, compound is dissolved in acetone and this solution poured into agitated ice water. Suspension of the compound is maintained by agitation.

To limit free HCl present, hydrogen halide acceptors are introduced. It is important to remove or limit the HCl as it can influence the extent or direction of the reaction. Replacement of the chlorines in the compound can be made before or after coupling reactions.

(Cyanuric chloride is a product of Nilok Chemicals, Inc., Dept. CP, 2000 College Ave., Niagara Falls, N.Y. . . . or for more information concerning manufacturer's product, reader may simply check CP 4497 on the convenient Reader Service slip which is located between pages 2 and 3.)

If you are using ALKYL AMINES

YOU CAN SAVE ON:

- ✓ Raw Material Cost
- ✓ Storage Facilities
- ✓ Handling

By using

SHARPLES ISOPROPYLAMINE

Raw Material Cost

1. By far the **lowest priced alkyl amine on the market**—molecular weight 59.1.
2. Isopropylamine can often replace both secondary and primary amines.

Storage Facilities and Handling

1. The lowest molecular weight amine available in anhydrous form. Does not require special containers.
2. Less storage space used—no water to store.



A SUBSIDIARY OF THE PENNSYLVANIA SALT MANUFACTURING COMPANY
500 Fifth Ave., New York • 80 E. Jackson Blvd., Chicago • 106 S. Main St., Akron
Executive Office: Philadelphia, Pa.
The Pennsylvania Salt Manufacturing Company of Washington:
Los Angeles • Tacoma • Berkeley • Portland
Shawinigan Chemicals, Ltd.: Montreal • Toronto
Airco Company International, New York

SHARPLES CHEMICALS Inc., Dept. A
Executive Offices, Widener Bldg.
Philadelphia 7, Pa.

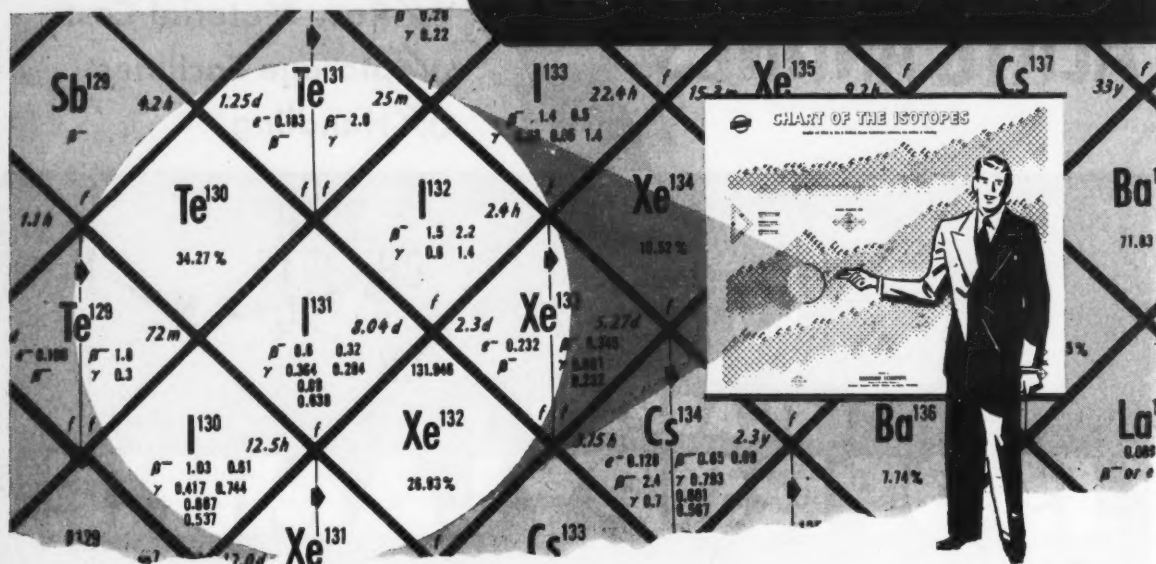
Gentlemen: Please send me full technical information on Isopropylamine.

Name _____
Company _____
Position _____
Address _____

When inquiring check CP 4498 on handy form, pgs. 2-3

All the useful
information about

ISOTOPES



contained in Harshaw Scientific's
COLOR CODED (wall) CHART of the ISOTOPES*

SIZE
5 feet wide
4 feet high

Invaluable as ready reference for teaching or those
working with or considering isotopes

Judged by many as the most useful wall chart since the periodic
chart of the atoms, the Harshaw Chart of the Isotopes makes avail-
able in easy to read and easy to use form ALL the useful information
about ISOTOPES.

Eight color codes make possible rapid identification of isotope
half-life and nuclear stability.

Every college and university can make excellent use of this chart
in their chemistry, physics, biology and biochemistry departments; also all
hospitals, medical schools, industrial research and control laboratories who
are working with or considering ISOTOPES.

The chart is 5' wide by 4' high and is equipped with metal edges for
hanging. Printed on Texoprint, a new plastic impregnated fibre paper
developed for navy charts, it is washable, non-creasing and extremely
tear resistant. Includes a guide book outlining instructions for reading the
chart and summarizes many applications for chart.

H-10950 — Chart of the Isotopes, 1953 Edition, complete
with guide book (postage prepaid) Each \$ 7.50
Outside continental limits of U. S. Rolled in mailing tube (air
express prepaid) Each \$15.50
Outside continental limits of U. S. folded and without metal
edges (postage prepaid) Each \$ 8.00

THE CHART PROVIDES THE FOLLOWING INFORMATION:

Element Name Atomic Mass Data
Atomic Number Element Symbol
Atomic Weight, 1952 Revision
Thermal Neutron Cross Section
Stable Isotopes Color Coded in Blue
Naturally Radioactive Isotopes
Color Coded in Green
Artificially Radioactive Isotopes
Coded by Half-life in 6 Colors
Radioisotope half-life
Modes of Radioactive Decay
Radiation Energies in Million
electron volts
Isomeric States
Isomeric Transitions
Nuclear Transmutation Code
Percentage Abundance of
Naturally Occurring Isotopes
Fission Data (thermal fission of U²³⁵)
Lithographed in 8 Colors Plus
Black and Gray
Corrected to February 1, 1953

Compiled and Edited by JOHN R. BRADFORD, Ph.D.
Director Radiotopes Laboratory, Case Institute
of Technology. *International copyright

CINCINNATI • CLEVELAND
DETROIT • HOUSTON
LOS ANGELES • PHILADELPHIA

HARSHAW SCIENTIFIC
Division of the Harshaw Chemical Company

MATERIALS

**Stability of catalytic activity, plus
15 to 20% higher equilibrium
in fluid cracking catalyst . . .**

alumina content is twice that normally available

Uses: As a high-alumina fluid cracking catalyst.

Features: Laboratory and commercial tests have
shown greater stability of catalytic activity, 15-
20% higher equilibrium activity, and in many
cases, improved selectivity of end-product distri-
bution. These are important factors in achieving
optimum performance in fluid cracking operations.

Description: Cracking catalyst has an alumina
content of 25% (by wt), contrasted with the 13%
normally used in synthetic catalysts. Stack losses
from cracking units have been found to be con-
siderably lower than those of 13%-alumina cata-
lysts under comparable operating conditions.

(Fluid cracking catalyst is a product of Refinery
Chemicals Dept., American Cyanamid Co., Dept.
CP, 30 Rockefeller Plaza, New York 20, N.Y. . . .
or for more information check CP 4500 on handy
form, pages 2 and 3.)

**Lignin coprecipitated with GR-S latex
makes a rubber reinforcing agent
having low tinting value . . .**

imparts low modulus, high elongation, tensile,
and hardness to vulcanizates

Uses: As a reinforcing agent for rubber,
especially where colored cured rubber products of
good physical properties are desired.

Features: Agent imparts low modulus, and high
elongation, tensile, and hardness to vulcanizates,
in comparison with other stocks of the same vol-
ume loadings. In addition, cured stocks have good
water resistance and flex life, and low flex crack
growth.

Compounds containing the agent have a lower
weight per unit volume than many others. Large
quantities of other pigments can be used to give
highly loaded stocks of good properties.

Description: Indulin-70-GR-S is a coprecipitate
of Indulin (company's trade name for the lignin
by-product of its kraft paper manufacturing opera-
tions) and GR-S-1500 (RFC designation). Ratio
of the two materials is 70 lb Indulin to 100 lb
GR-S. (Details of manufacturing process are given
in CHEMICAL PROCESSING, October, 1954, pp 16-17.)

The coprecipitate may be compounded by rubber
processors either with or without the addition of other
filler pigments or rubber, and with the usual curing
chemicals. Since specific gravity of the agent is 1.3,
cured compounds are relatively light in weight.

When inquiring check CP 4499 on handy form, pgs. 2-3

MATERIALS

A typical light-colored compound has the following formula. Total pigment volume loading is 78.4.

Indulin-70-GR-S	97.2
GR-S	42.8
Stearic acid	1.5
Coumarone-indene resin	7
Calcium silicate	100
Zinc oxide	5
Benzothiazyl disulfide	1.5
Copper dimethyldithiocarbamate	0.24
Sulfur	2.5

Physical properties of this compound after curing are as follows:

Tensile strength (psi)	2450
300% modulus (psi)	2200
Elongation (%)	380
Crescent tear resistance (lb/in)	440
Hardness (Shore A)	93
Sp gr	1.32
Water absorption (% increase in weight after 70 hr)	3.2
Low temp flex (Thiokol bent loop brittleness @ -40° F)	passed

Addition to TiO_2 gives a much lighter color to the stock with little change in properties.

(Reinforcing agent for rubber is a product of Polychemicals Div., West Virginia Pulp and Paper Co., Dept. CP, P.O. Box 832, Charleston, S.C. . . . or for more information check CP 4501 on convenient Reader Service slip located between pages two and three.)

New chemicals spotlighted . . . in April CP

If you're looking for a chemical raw material then you won't want to miss the April issue of CHEMICAL PROCESSING. In it, the Materials section will be featured, and expanded to include a descriptive listing of chemicals introduced in 1954.

In addition to this listing, the section will include a detailed alphabetical index of uses as recommended by chemical materials manufacturers.

This featured section will also have . . . a Guest Editorial on chemical developments by an outstanding authority in the field . . . data sheets showing physical properties of chemical materials in easy-to-read nomographs . . . and, of course, the regular articles on new chemicals!!!

In keeping with our policy of "balanced editorial", the other sections of CHEMICAL PROCESSING will appear as always.



Celanese* acetyl production delivers— for all industries

Celanese, dependent only on natural petroleum sources and Celanese-produced intermediates, can synthesize every important acetyl chemical and produce it in continuous volume.

Our two plants—at Bishop and Pampa, Texas—are a dual dependable source for all industries that need acetic acid, acetaldehyde, or any other acetyl. As now acetyl chemicals become commercially useful, Celanese is in a basic position to make them available in commercial quantities.

Consequently, if acetyls figure in your formulation, make us your volume source.

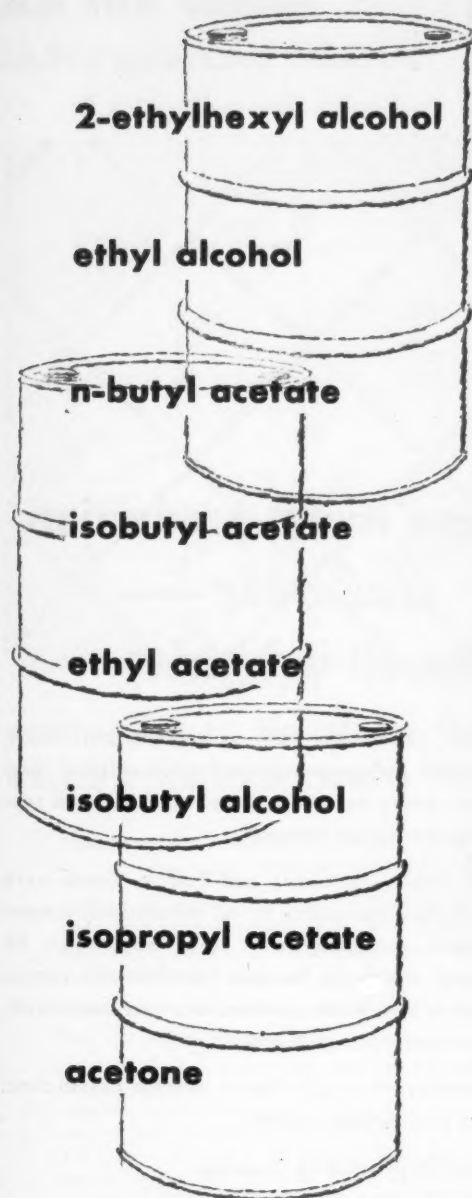
Celanese Corporation of America,
Chemical Division, Dept. 591-A,
180 Madison Avenue, New York 16.



*Reg. U. S. Pat. Off.

ACETIC ACID • ACETALDEHYDE • ACETIC ANHYDRIDE • ACETONE • n-BUTYL ACETATE • n-PROPYL ACETATE

When inquiring check CP 4502 on handy form, pgs. 2-3



Eastman

CHEMICAL PRODUCTS, INC.

Kingsport, Tennessee

subsidiary of EASTMAN KODAK COMPANY

Eastman solvents

These products are stored in bulk in the major industrial centers of the United States. For further information, write or call your nearest Eastman representative.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 Michigan Ave.; Houston—412 Main St.; St. Louis—Continental Bldg. **West Coast: Wilson Meyer Co.,** San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Salt Lake City—73 S. Main St.; Seattle—821 Second Ave.



MATERIALS

Good flexibility, flame resistance, and low extraction result with extender for vinyl resins . . .

up to 1/4 of primary plasticizer can be replaced without deleterious effect

Uses: As a low-cost extender in plasticizing systems for vinyl resins used in molding, extrusion, and calendaring compounds for such applications as floor tile, wire and cable insulation, protective covers, and molded grips. Extender can also be used in water-proofing duck tentage and in adhesives, paints, and special-purpose lubricants.

Features: Good flexibility, flame resistance, and low oil and water extraction result when extender is used. Due to lower viscosity, compound has good wetting properties and pours fast. Finished products show low change in flexibility with changes in temperature.

Up to one-fourth of the primary plasticizers can be replaced without deleterious effect on physical properties of most formulations.

Description: Halowax product 4004 is a liquid chlorinated aliphatic hydrocarbon of medium viscosity and light color. Containing about 40% chlorine, extender is more heat-stable than other products of its type and is non-flammable. Soluble in ketones, hydrocarbons, and chlorinated hydrocarbons, product is compatible with most natural and synthetic waxes and resins, and commonly used plasticizers. Properties include:

Color (Gardner)	4
Sp gr (@ 25°C)	1.135
Viscosity (cp @ 25°C)	440
(cp @ 90°C)	24
Flash point (ASTM, COC)	(none)
Free chlorine	(none)
Sediment and suspended matter	(none)

Small amount of stabilizer insures against deterioration during storage and use at ordinary temperatures. However, additional stabilizers may be required for use at elevated temperatures, as shown in typical formulation:

Injection Molding Compound

	Per cent
Vinyl resin Bakelite VYNW-5	40.0
Flexol plasticizer DOP	29.6
Halowax product 4004	7.4
Tribase E stabilizer*	2.0
Atomite**	20.0
Calcium stearate	1.0
	<hr/> 100.0 <hr/>

*National Lead Co.

**Thompson Weinmar and Co.

(Vinyl resin extender is a product of Bakelite Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 260 Madison Ave., New York 16, N.Y. . . . or for more information check CP 4504 on handy form, pages 2 and 3.)

When inquiring check CP 4503 on handy form, pgs. 2-3

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Two brown pigments based on iron oxide are added to line

Two iron oxide-based brown pigments extend still further company's Mapico series:

Tan 15 is useful in high gloss and semi-gloss enamels and flat paints. Oil absorption is 31.35 lb/100 lb pigment. It is highly compatible with whites and other pigments, is light-fast, non-bleeding, and resistant to attack by alkalis and acids. Particle size is fine, giving easy dispersion, bright color reflectance, and exceptional softness.

Brown 422 has a specific gravity of 4.70, and bulking value for one pound is 0.02554 gallon. Browns made with it are exceptionally rich in color and have shelf stability.

(Brown pigments are products of Columbian Carbon Co., Dept. CP, 380 Madison Ave., New York 17, N.Y. . . . or for more information reader may simply check CP 4505 on handy form which is located between pages 2 and 3.)

Reodorant improves odor of No. 1 and No. 2 fuel oils . . .

concentrations of 0.006-0.008 per cent recommended

In order to improve odor of No. 1 and No. 2 fuel oil and other petroleum products, manufacturer has started commercial production of Alamask 0.19 and 0.20 reodorants. Concentrations of 0.006% for No. 1 fuel oil and 0.0085% for No. 2 oil are recommended.

(Petroleum reodorants are a product of Industrial Reodorants Div., Rhodia, Inc., Dept. CP, 230 Park Ave., New York 17, N. Y. . . . or for more information check CP 4506 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 4507 . . . see information request blank between pages 2 - 3.



CONSTANT SAMPLING ASSURES UNIFORMITY. Samples are drawn from the top, middle and bottom of every

tank car and tank truck shipment. Sun files every purity analysis—available for your reference.

USERS REPORT BIG DIVIDENDS FROM HIGH-PURITY SUN AROMATICS

Processing easier, yields higher; all at no increase in price!

The higher purity of Sun's aromatics is already paying big dividends. Several Sun customers are reporting higher yields. Others claim they are getting better, more uniform products. One company reports they have been able to eliminate completely a purification step in processing—and still maintain the quality of their end product. And all these plants are getting these dividend-producing, higher-

purity products at no increase in price!

The high purity of Sun's Benzene, Toluene and Xylene is no accident—Sun spent \$15 million on a plant specifically designed to produce quality products. Rigid controls and constant testing assure you of the same uniform, high-purity products month in and month out.

Find out what dividends Sun aromatics can give you. Write Dept. CP-1.

**INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY**

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL
Refiners of famous High-Test Blue Sunoco Gasoline

TYPICAL TESTS



BROMINE INDEX. The extreme sensitivity of this new test tells Sun Engineers when filters need changing—long before filter deterioration can affect the quality of Sun's aromatics. It assures you of both uniformity and high purity.



DISTILLATION RANGE. Every sample tested must fall within the narrow boiling range specified in ASTM Method D-850. Typical analyses show that Sun's aromatics usually have a much narrower boiling range than is required to pass this test.



PARAFFIN TEST. Sun Toluene is guaranteed to contain less than 0.5% paraffins—substantially below the ASTM maximum of 1.5%. Samples normally contain no measurable paraffin whatever.



Petrochemicals

...from the most
completely integrated
production unit in the world

The Petro plant at Tuscola, Illinois was planned for the most efficient production possible. These factors were considered carefully:

RAW MATERIALS...natural gas is taken directly from the Panhandle Eastern pipe line compressor station at Tuscola for further processing.

FLOW OF MATERIALS... nothing is wasted. For example, while the main product of the ethylene unit feeds the ethyl chloride, ethyl alcohol and polyethylene plants, by-product hydrogen flows to U. S. Industrial Chemicals Co. ammonia manufacture, and also to the chloride process. Spent sulfuric acid from the alco-

hol unit is returned to the U.S.I. plant it came from.

TRANSPORTATION... three railroads and two main highways converge at Tuscola for ease in transporting materials.

PRODUCTION AND QUALITY CONTROL...extensive laboratories staffed with specialized research, development and control personnel keep pace with the latest process and product improvements, and insure uniformly fine products.

Add this production unit to your facilities. Our engineers will be glad to discuss your long term bulk requirements for chemicals from Petro.

Ethyl Chloride • Ethyl Alcohol • Ethyl Ether • Polyethylene

NATIONAL PETRO-CHEMICALS

C O R P O R A T I O N

A joint enterprise of National Distillers Products Corporation and Panhandle Eastern Pipeline Company

99 PARK AVENUE, NEW YORK 16, N. Y.

MATERIALS

Wetting agent for asphalt products is effective in high temp applications . . .

maximum bonding effectiveness obtained with 1/4-1 1/4% addition, on wt of asphalt

Uses: As an aid in coating surfaces with pure or cutback asphalts, or asphalt emulsions. Still in developmental stage is use as a wetting agent for asphalt products such as roofing materials, tile, automotive undercoatings, joint fillers, water-proofing paints, rust preventives, and molded asphalts.

Features: Surface-active properties of compound enable it to displace moisture from a surface, which also aids its wetting ability. Additive is not destroyed by heat when contained in pure asphalt or asphalt compounds. This feature enables it to be used in many applications where high temperatures are involved.

Description: Called Pave, additive was primarily developed for use in asphalt paving industry, but has proved successful in other asphalt materials. Typical properties of the 80%-active dark brown liquid include:

Viscosity (Saybolt sec. @ 100°F)	750.8
(sec. @ 140°F)	246.0
Pour point (ASTM, °F)	15
Flash point (COC, °F)	200
Sp gr (60/60°F)	0.9482

Compound is available in a 100%-active form for applications other than asphalt paving. Viscosity lends itself to easy handling without requiring cutting back.

Amount of additive required to obtain maximum bonding effectiveness will average 1/2%, based on wt of asphalt. This amount can vary from 1/4 to 1 1/4%, depending upon type of asphalt and other materials.

(Wetting agent for asphalt is a product of Carlisle Chemical Works, Inc., Dept. CP, Reading Rd., Reading 15, Ohio . . . or for more information check CP 4508 on handy form, pages 2 and 3.)

Reinforcing agent for silicone rubbers provides low water absorption, is easy processing . . .

various plastics applications also promising

Uses: While developed as an effective reinforcing filler for silicone rubber stocks, agent shows promise in various plastics applications, paint, varnish and lacquer, greases, inks, textile treatments, cosmetics and pharmaceuticals.

Features: In silicone rubber compounds, filler provides a very good level of reinforcement, easy processing, and low water absorption figures in comparison with other commonly-used fillers.



of Dow Corning
ANTIFOAM A
KILLS FOAM IN

10 TONS
of asphalt or
10 tons of alkyd resin

2630 lbs.
of fermenting wine

1474 lbs.
of soap tallow

500 lbs.
of metallic soaps

Save space now wasted on foam;
cut processing time; eliminate waste and
fire hazard of overflowing foam.

Use Dow Corning Antifoam A, the
most versatile and efficient defoamer on
the market.

DOW CORNING ANTIFOAM AF EMULSION
New water dispersible emulsion of
Antifoam A is equally versatile, equally
effective in the industrial processing of
aqueous foamers.

mail coupon **TODAY for**
free sample

DOW CORNING
SILICONES

Dow Corning Corporation
Midland, Mich., Dept. 3201

Please send me data and a free sample of

☐ Dow Corning Antifoam A
or ☐ Dow Corning Antifoam AF Emulsion

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 4509
on handy form, pgs. 2-3

MATERIALS

Description: Hi-Sil X303 is a hydrated silica of high purity and extremely fine ultimate particle size. Physical and chemical properties include:

Average particle size (μ)	22
Surface area (sq m/gm)	160
Sp gr	1.95
Bulk density (lb/cu ft)	3
pH (in 5% aqueous soln.)	4.5
Color	white
Chemical composition (%)	
SiO ₂	88
NaCl	0.04
Na ₂ SO ₄	0.10
Ignition loss	10

(Hydrated silica is a product of Columbia-Southern Chemical Corp., a subsidiary of Pittsburgh Plate Glass Co., Dept. CP, 420 Ft. Duquesne Blvd., Pittsburgh 22, Pa. . . or for more information check CP 4510 on handy form, pages 2 and 3.)

Makes surface coatings resistant to scratching, chemicals . . .

petrochemical liquid used as oil base-stock provides good adhesion

Uses: As an oil base-stock for varnishes, masonry paints, surface coatings, and metal primer formulations.

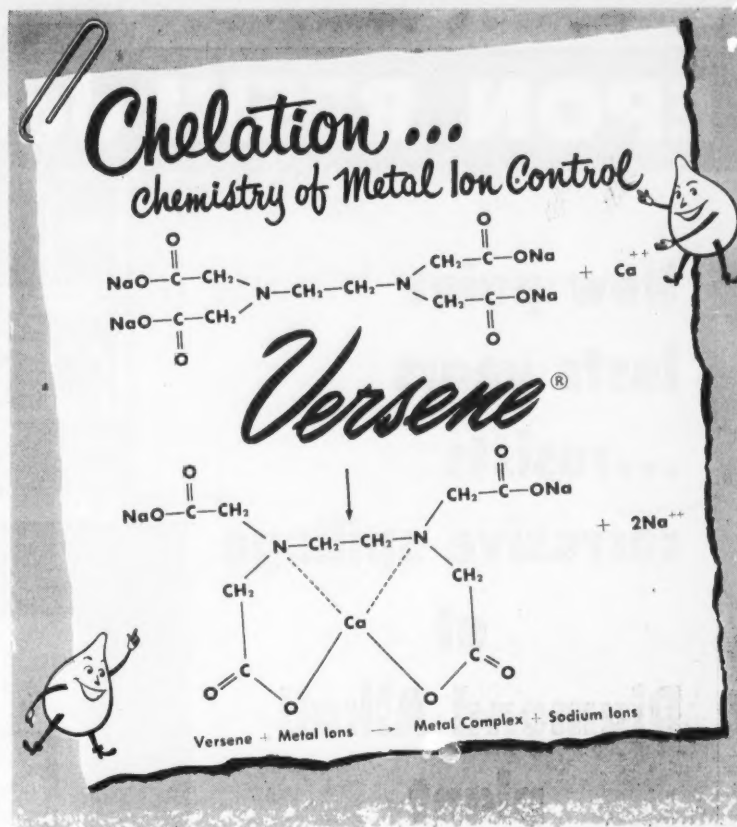
Features: Experiments show that surface coatings made from this oil are very difficult to scratch through. An enamel still looked like new and resisted scratching after being submerged for five years in harsh chemical solvent. Coatings also resist attack by alkali, dilute acid, or water. Experimental enamels and varnishes with lasting mirror-like gloss have been made.

Because it is substantially colorless, oil makes a neutral-colored varnish which brings out natural grain of wood. Absence of color also gives this new base-stock an advantage in making white paints. Films also form an extremely tight bond to metal surfaces.

Description: C-Oil is a heavy-bodied, sticky, almost colorless liquid petrochemical based on butadiene. If further developments prove as successful as indicated, the oil will reduce industrial paint manufacturers' dependence on agricultural oils.

Oil is presently being produced in semi-commercial quantities. The Glidden Company, Dept. CP, 10999 Madison Ave., Cleveland 2, Ohio, has been licensed to develop surface coating uses for the petrochemical. Use in plastics has also been suggested.

(Paint base-oil is a development of Esso Laboratories, Standard Oil Development Co., Dept. CP, P.O. Box 51, Linden, N. J. . . or for more information check CP 4511, pages 2 and 3.)



VERSENE® — KEYS TO CHELATION

Not so long ago "Chelation" and "Versenes" were little known, unfamiliar words. Today, however, practically every chemist understands that chelation is the chemistry of metal ion control and that the Versenes are the chemicals that make it work. Over the last quarter-century Bersworth and Versenes Incorporated have pioneered and developed this new concept of trace metal control to a point where it has now become a leading chemistry of our time.

MOLE-FOR-MOLE TRACE METAL CONTROL

Probably nothing creates more complexing problems in industrial, agricultural or medical chemistry than excesses or deficiencies of metallic ions. Prior to chelation and the Versenes there was no specific way to solve them. But now, the Versenes provide exacting mole-for-mole control over trace metals throughout the pH range.

APPLICATIONS UNLIMITED

Whenever you have a problem that involves the control of metallic ions you are invited to share our accumulated research, knowledge and experience in this field. We can help you stabilize pharmaceuticals; prepare pure metal compounds; improve wet processing of products and prevent or remove stains in textiles, tanning or paper; get better control over polymerization or hard water scale; secure clear and brilliant solution formulations; obtain more efficient soaker alkali formulations; remove rust without embrittlement; develop up-to-date analytical procedures; cure chlorosis in plants, etc.; treat heavy metal poisoning; insure chemically clean surfaces for metal finishing; increase detergency of soaps and synthetics; get better "kills" with quaternary sanitizers.

Send for Technical Bulletin No. 2. Ask for samples.
Chemical Counsel on request.



"Chemistry's most precise chemicals"

VERSENE INCORPORATED

FRAMINGHAM, MASSACHUSETTS

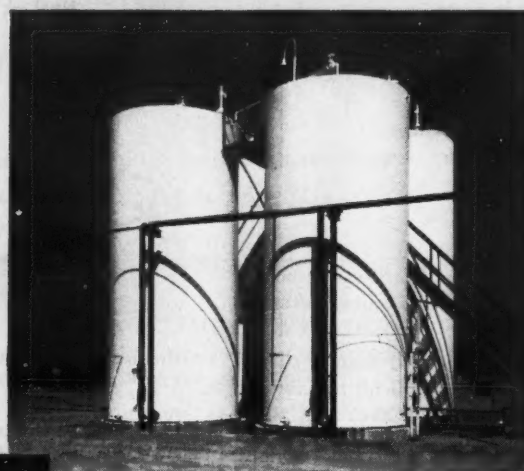
WAREHOUSE STOCKS

Chas. S. Tanner Co., Liberty Life Bldg., Charlotte, N. C.
Kraft Chemical Co., Inc., 917 West 18th Street, Chicago 8, Illinois
Independent Chemical Corp., One Hanson Place, Brooklyn 17, New York
George Mann & Co., Inc., 251 Fox Point Boulevard, Providence, Rhode Island
Baroda & Page, Inc., Houston, Dallas, Corpus Christi, New Orleans,
St. Louis, Wichita, Oklahoma City, Tulsa, Kansas City, Mo.
Braun-Knecht-Heimann Co., San Francisco, California
Van Waters & Rogers, Inc., Seattle, Wash. & Portland, Ore.
Braun Corporation, Los Angeles, California
European Manufacturing Agent
Resolinfabriken Aktiebolag, Helsingborg, Sweden

When inquiring check CP 4512 on handy form, pgs. 2-3

EPON[®] RESIN does it!

**New paint
lasts years
...resists
corrosive spillage
at
Diamond Alkali
plant**



HERE'S HOW...

PAINT LEADS a hard life at the Diamond Alkali Company agricultural chemicals plant in Houston, Texas . . . and no ordinary paint can survive there for long!

A few reasons for paint failure: Processing vessels and storage tanks are subjected to spillage of chlorinated hydrocarbons and benzene, and some also to heat. In parts of the plant, painted surfaces are exposed to the highly corrosive fumes of hydrogen chloride and sulfuric acid.

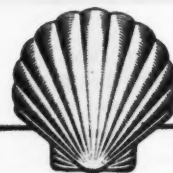
In their search to find a tougher, longer lasting paint, Diamond Alkali maintenance men tried coatings of many types, including heavy duty maintenance finishes. Some "washed

off" immediately; some lasted 6 to 8 months. Finally, Epon resin coatings based on the XA-200 formulation were tried — and found outstandingly successful.

The Epon cold-cured paint, applied by spraying throughout the entire plant, has been in service for *more than two years with no failure*. Painting costs — for both material and labor — are a mere fraction of what they formerly were, reports Diamond Alkali.

Call on our sales offices for names of suppliers who sell Epon resin coatings for your needs. Write for the full Epon coatings story in the new brochure, "Planning to Paint a Pyramid?"

When inquiring check CP 4513 on handy form, pgs. 2-3



SHELL CHEMICAL CORPORATION

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Industry and Agriculture**
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IN CANADA:
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Company of Canada, Limited
Toronto • Montreal • Vancouver

MATERIALS

Catalogs fatty acids, glycerides, sperm oils, and fatty alcohols

Four major products, fatty acids, glycerides, sperm oils, and fatty alcohols are described in 40-page two-color catalog. For each product, average specifications, composition, and application information are presented. Definitions of terms and chemical descriptions of each product are given, as are solubility charts for the fat chemicals.

"Hydrofol Products" fat chemicals catalog is issued by Chemical Products Div., Archer-Daniels-Midland Co., Dept. CP, 2191 W. 110th St., Cleveland 2, Ohio. When inquiring specify CP 4514 on handy form, pages 2 and 3.

Produces clear amber color in glass formulations . . .

ground manganese sulfide is thermally stable

Uses: As a glass colorant for use as a direct or partial replacement for iron-sulfur sources in conventional amber glass formulations.

Features: Compound produces a clear amber color, free from "muddiness." It is thermally stable and of uniform quality.

Description: Manganese sulfide is available in ground form. Particle size is less than 20 mesh, 70-75% passing through 140 mesh.

(Ground manganese sulfide is a product of Foote Mineral Co., Dept. CP, 18 W. Cheltenham Ave., Philadelphia 44, Pa. . . or for more information check CP 4515 on handy form, pages 2 and 3.)

Stabilizer for clear, rigid PVC has low toxicity . . .

irritating fumes during processing are minimized

Uses: As a stabilizer for clear rigid vinyl formulations.

Features: Toxicity is lowest of any metallic stabilizer commercially available. During processing, only a very small amount of irritating fumes are given off.

Description: Stabilizer T-72 is a non-mercaptide organo-tin compound. In general, 3 to 5% is used in formulations, depending upon temperature and cure cycle. As far as toxicity, LD₅₀ is 0.57, compared to 0.2 for most organo-tin stabilizers.

(Stabilizer for PVC is a product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N.Y. . . or for more information check CP 4516 on handy form, pages 2 and 3.)

Spreadability, covering power, adhesion improved in asphalt paints and emulsions . . .

sodium alginate disperses easily in hot water

Uses: In asphalt paints and emulsions, as a stabilizer and thickener. Also, as a foundry sand binding agent.

Features: Product makes paints that are easier to spread and improves their covering power and adhesion. It disperses easily in hot water without forming lumps and does not require big stirring machinery.

Description: Protatek 53 is technical sodium alginate, a brown powder ground to about 80 mesh. Viscosity in 0.3% (dry wt) solution is 7 to 10 cps; in 1% (actual wt) solution, 40 cps.

(Sodium alginate is a product of Croda Inc., Dept. CP, 51 Madison Ave., New York 10, N. Y. . . . or check CP 4518 on handy form, pages 2 and 3.)

Pharmaceuticals, resinous products prepared from glucine amide hydrochloride

Uses: As an intermediate for pharmaceuticals, mercaptoglyoxaline derivatives, aralkyl substituted compounds, and brittle resinous products.

Features: Pharmaceutical derivatives have spasmolytic, analgesic, and sedative action. Acylated and arsenoso derivatives have therapeutic value, such as analeptics. Reacted with formaldehyde, hard brittle resinous products are formed.

Description: Glycine amide hydrochloride has a reactive amine and methylene group. Soluble in ethanol and water, it has a melting point of 177-182°C.

(Glycine amide hydrochloride is a product of Jasonols Chemical Corp., Dept. CP, 825 E. 42nd St., Brooklyn 10, N.Y. . . . or for more information check CP 4519 on handy form, pages 2 and 3.)

Describes the properties and usages of organic phosphate insecticide

Possessing low toxicity to warm-blooded animals while retaining necessary killing power against spider mites, mealybugs, soft brown scale, aphids, and leafhoppers, organic phosphate insecticide Malaphos is described in pocket-size folder.

Bul 582-2 is issued by Eston Chemicals Div., American Potash & Chemical Corp., Dept. CP, 3100 E. 26th St., Los Angeles 23, Calif. When inquiring specify CP 4520, pages 2 and 3.

Caustic Soda—

which strength should you buy?

Here are the facts to help you decide which saves you more—50% or 73%

Can you save by switching from 50 to 73% liquid caustic? Your answer will depend on:

1. Your caustic soda freight rate.
2. Your facilities for handling caustic.
3. The amount of caustic you use.

Advantages of 73% liquid

1. With 73%, there is a substantial saving in freight charges. 63% less water is shipped per unit weight of dry caustic soda.
2. You will place fewer orders. This cuts down on your billing work.

Disadvantages of 73% liquid

1. It is priced \$2.00 more per ton (dry basis) than 50% because of higher manufacturing costs.
2. If you store it as 73% liquid, you will need heated, nickel-clad steel storage tanks.
3. If you dilute 73% to 50% while unloading, you will need a cooler and other equipment. This represents a considerable investment which can be reduced if you have

suitable equipment already on hand.

Use this table to see if you can save with 73%

Use the table at right to find your approximate saving on freight charges with 73% liquid caustic. The table balances two cost factors . . . lower freight charges and the higher initial price of 73% liquid caustic.

To estimate your yearly savings, multiply the figure in the right-hand column which applies to you by your annual consumption in tons (dry basis).

From these savings you will have to deduct the cost of equipment for diluting to 50% while unloading.

Freight rate per hundred weight in cents (including taxes)	Net savings per ton (dry basis) in dollars
5	minus 1.40
10	minus .80
15	minus .10
16	0
20	.60
25	1.20
30	1.80
35	2.40
40	3.00
45	3.70

HERE'S HELP—WITHOUT COST

You gain much by choosing the right strength for your conditions. In coming to a decision, why not give yourself the advantage of unbiased expert technical help? A call to your nearest Hooker sales office puts at your disposal, without obligation, the experience gained in 50 years of supplying caustic soda to industry.

Your Hooker technical service man can show you what equipment you need for converting,

and help you figure your exact savings. Why not phone or write him today at the nearest Hooker office?

* * *

"CAUSTIC SODA BUYER'S GUIDE" is the title of a new pocket-size booklet we will be glad to send you. Contains helpful facts on the economics of 50% and 73% solutions; other forms of caustic soda; capacities of tank cars and other containers; useful shipping information. Write for a copy.



—1905—Half a Century of Chemicals from the Salt of the Earth—1955—

HOOKEE ELECTROCHEMICAL COMPANY

15 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

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When inquiring check CP 4521 on handy form, pgs. 2-3

THFA* *an important starting point*

HIGH BOILING ESTERS and ETHERS

DIHYDROPYRAN and GLUTARIC ACID

Side Chain Reactions

Reactions involving the Ring

THFA

for the preparation of New Chemical Products



Quaker Oats' THFA (tetrahydrofurfuryl alcohol) is a convenient starting point for the preparation of high boiling esters and ethers where its function is that of a primary alcohol. The esters are useful commercially as plasticizers and weed killers.

The reactions of THFA as a cyclic ether are of increasing importance. Such reactions include: (A) ring cleavage to yield open chain compounds, such as pentanetriol; (B) cleavage and subsequent cyclization to 2,3-dihydropyran; (C) cleavage and cyclization to pyridine. Intermediates produced from THFA are useful in the synthesis of lysine, glutaric acid and other products of potential importance.

THFA is readily available in commercial quantities; two grades are offered in cans, drums, and tank cars.

PROPERTIES (PURE COMPOUND)

Boiling point, °C. 747 mm.	177.8
Specific gravity, 20/20	1.054
Refractive index, n 20/D	1.452
Water solubility	complete

Send for a sample of tetrahydrofurfuryl alcohol and further information about the product. (Bulletin 87 C).

*Reg. U. S. Pat. Off.

The Quaker Oats Company

CHEMICALS DEPT.

336Y The Merchandise Mart, Chicago 54, Illinois
Room 536Y, 120 Wall St., New York 5, N. Y.
Room 436Y, P. O. Box 4376, Portland 8, Oregon

In Europe: Quaker Oats-Graanproducten N. V.,
Rotterdam, The Netherlands;
Quaker Oats (France) S. A., 3, Rue Pillet-Will, Paris IX, France
In Australia: Swift & Company, Pty., Ltd., Sydney
In Japan: F. Kanematsu & Co., Ltd., Tokyo

When inquiring check CP 4522 on handy form, pgs. 2-3

MATERIALS

Reagent grade of methyl acetate has non-volatile content less than 0.002 %

Certified reagent grade of methyl acetate has non-volatile content less than 0.002%. Lot analysis is on each label. Compound has been specially purified for use by laboratories preparing and testing organic compounds requiring a reagent with non-volatile matter held to a specified minimum. Material is available in laboratory quantities and is packaged by volume.

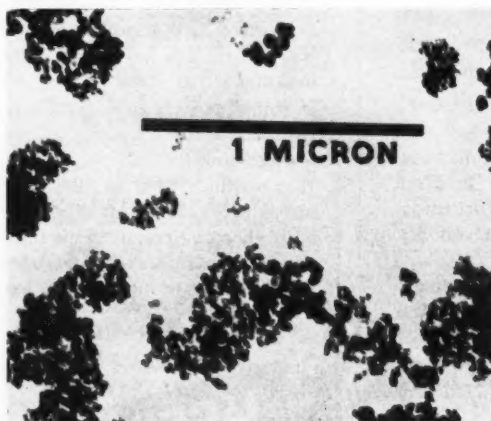
(Reagent methyl acetate is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . or for more information check CP 4522A on handy form, pages 2 and 3.)

Extremely fine particle size with high purity exhibited by silica soot . . .

non-agglomerating nature of the particles permits maximum realization of properties

Uses: Properties suggest use as a reinforcing filler for synthetic rubbers and plastics, a flattening agent and extender for protective coatings, a thickener for lubrication greases, and as an additive in textile finishing.

Features: Exhibiting a high degree of purity and extremely fine particle size, silica has a high degree of particle separation. Non-agglomerating



Particles of silica soot are 10-20 μ in diameter

nature of particles permits maximum realization of surface area and oil absorption properties. Readily friable, it is easily dispersed in elastomeric compounds and in solvent, oil, or water-based systems.

Description: Silica soot is produced by burn-

NEW JOBS FOR CO₂

No other gas works so hard or so well—at so many jobs. These are typical examples of CO₂ at work. Scores of other applications, covering all industry, are available from Liquid Carbonic, world's largest producer of CO₂.

easy as pie

Blending the lard into pre-mix pie crust mixes posed a lumpy problem to the manufacturer. The addition of pulverized dry ice holds the lard at a temperature where it actually handles like powder—blends perfectly.

hides get help

In pre-tanning processes, CO₂ is the ideal weak acid for lowering and controlling pH of the skins. Why ideal? The close control required by stronger acids isn't necessary. CO₂ is also far easier and safer to handle.

wonder drugs last longer

Heat harms blood plasma, penicillin and other pharmaceuticals. Yet, for these drugs to be stored, moisture must go. The answer is CO₂ "freeze drying." CO₂ is fully as effective as other systems—yet capital outlay is minute in comparison.

next case... yours

There's practically no end to the important jobs that CO₂—combined with Liquid Carbonic savvy—is doing. Chances are this combination can come up with some surprising answers for you, too.

For more examples of CO₂'s amazingly diversified talents, send for LIQUID's new free booklet, "Applications Unlimited." Just use the coupon below.

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City _____ Zone _____ State _____

When inquiring check CP 4523 on handy form, pgs. 2-3

CHEMICAL PROCESSING

ing silicon tetrachloride in presence of combustible gases. Manufactured on semi-commercial scale, it is available in a pelletized form that is easy to handle and essentially dustless.

Typical Properties

SiO ₂ content (%)	>99
Ignition loss (after conditioning for 3 hr @ 150°C)	0.16
After 1 hr @ 300°C (%)	.64
After additional hr @ 1000°C (%)	10-20
Particle size (mμ)	2.2-2.3
Sp gr	1.475
Refractive index (@ 25°C)	5.3
pH (4 gm dispersed in 100 ml H ₂ O)	5.3
Bulk density (lb/cu ft)	150-200
Surface area (Air permeability method, sq m/gm)	4.38
Oil absorption (ASTM, gm linseed oil per gm silica)	

Toxicological properties have not been fully investigated. Inhalation of dust should be avoided.

(Silica soot is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . or for more information check CP 4524 on handy form, pages 2 and 3.)

Carbohydrates labeled by C¹⁴ are made available to research workers

Especially useful to researchers in the fields of nutrition, intermediary metabolism, fermentation, and photosynthesis are three C¹⁴-labeled carbohydrates. D-Glucose (1-C¹⁴), D-glucono- δ -lactone (1-C¹⁴), and D-mannose (1-C¹⁴) are available in four package sizes from 1.0 to 0.05 millicurie.

(Tagged carbohydrates are products of Nuclear-Chicago, Dept. CP, 229 W. Erie St., Chicago 10, Ill. . . or for more information check CP 4525 on convenient Reader Service slip located between pages 2 and 3.)

Important organic reactions of succinonitrile given

Reactions of succinonitrile with water, organic chemicals such as alcohols, esters, and polyhydric phenols are given in 16-page bulletin. A two-page diagram summarizes the reactions of both the nitrile and methylene groups. Suggested uses, toxicity and handling information, and physical properties are presented. Bibliography contains 72 references.

Technical Bul No. O-116 is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 4526 on handy form, pages 2 and 3.

Norton materials for high temperature processing

CENTIGRADE		C°		Temperature of Electric Arc Furnace 4000° C - 7230° F	F°
2 x 10 ¹	H-Bomb Ignition	Melting Point			Melting Point
3540				ZIRCONIUM CARBIDE ZrC	6400
3300				FUSED THORIA ThO ₂	5970
3140				TITANIUM CARBIDE TiC	5680
3060				ZIRCONIUM BORIDE [†] ZrB ₂	5540
3000				BORON NITRIDE BN	5430
2900				TITANIUM BORIDE [†] TiB ₂	5250
2700				FUSED ZIRCONIA ZrO ₂	4900
2620				MAGNORITE [†] Fused Magnesia MgO	4750
2450				NORBIDE [†] Boron Carbide B ₄ C	4440
2300				CRYSTOLON [†] Silicon Carbide SiC	4170
2000				38 ALUNDUM [†] Aluminum Oxide Al ₂ O ₃	3630
1900				REGULAR ALUNDUM [†] Aluminum Oxide Al ₂ O ₃	3450

Temperature range of Norton electric furnace materials

Not True Color Temperatures

Are You Stymied by a "High Temperature Barrier?"

Are you concerned with industrial processing involving temperatures ranging upwards to 4000° C? If so, Norton Company has developed and is continually improving materials — produced and purified in electric arc and high temperature resistance furnaces — which may help you solve difficult technical problems. Norton Company supplies these materials in crude, processed or fabricated form — and will work with you in engineering them to your requirements. For further information, write to NORTON COMPANY, Refractories Division, 560 New Bond Street, Worcester 6, Mass.

Making better products. . . to make other products better

NORTON
REFRACTORIES

Engineered Prescribed

[†]Experimental Materials
*Trade-Marks Reg. U.S. Pat. Off. and Foreign Countries

When inquiring check CP 4527 on handy form, pgs. 2-3

REEVES

Vari-Speed Motor Pulley

NEW!

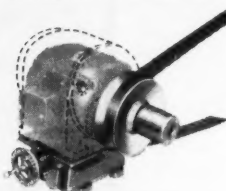


**Smaller Units!
More HP!**

**Completely new
redesigned line
from 1/2 to 15 HP!**



"spiral-groove" lubrication



For new or old NEMA Motors

CHECK ALL THESE NEW REEVES FEATURES

- 1 New, smaller disc assemblies are engineered for new NEMA Motors, yet usable with old.
- 2 New spiral-groove lubrication assures complete lubrication for years of rust-free, trouble-free service.
- 3 One-point lubrication. Unit can be lubricated when stopped, or *while in operation*.
- 4 Superior base construction provides greater rigidity and strength, reduces vibration and noise.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

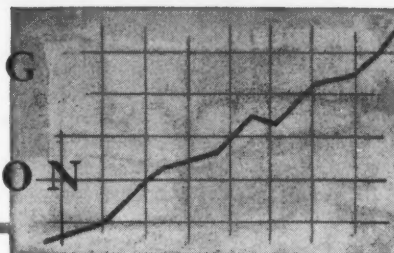
Write for complete details and new bulletin today!

Specify Dept. CP8a-V545.



When inquiring check CP 4528 on handy form, pgs. 2-3

EXPANDING CHEMICAL PRODUCTION



Lithium Chemicals plant planned for Texas

American Potash & Chemical Corporation has completed plans for construction of plant for manufacture of lithium chemicals near San Antonio, Texas. Facility will be owned by newly-formed company, American Lithium Chemicals, Inc. American Potash owns 50.1 per cent of company's stock and balance is held by Bikita Minerals (Private) Ltd. Total capital requirements of American Lithium Chemicals, Inc., and the Bikita property will be in excess of \$8 million. Lithium ores for plant will be supplied by Bikita Minerals from its large deposit of high-grade lithium ores in Southern Rhodesia, Africa. Initial production at San Antonio will be lithium hydroxide. American Potash & Chemical Corporation has produced lithium chemicals at its Trona, California, plant since 1934. All of the Trona output since 1951 has been in the form of lithium carbonate.

Mobay Chemical selects W. Va. as isocyanate plant site

First full-scale production plant in America for manufacture of isocyanate chemicals will be built near New Martinsville, W. Va., by Mobay Chemical Company of St. Louis. Recently-formed Mobay company is jointly owned by Monsanto Chemical Company and Farbenfabriken Bayer A.G. of Germany. Plant will be capable of producing several hundred tons of isocyanate chemicals a month and equivalent amounts of polyester resins. Complete production facilities for Mobay's resins will be constructed on 200-acre site, which Mobay has acquired, seven miles north of New Martinsville, on the Ohio River. This site is adjacent to Colum-

bia-Southern Corporation's chemical plant which will supply some of Mobay's raw materials by pipeline. Target date of completion for the plant is late this year.

Sun Oil plans ammonia unit at Marcus Hook refinery

Sun Oil Company has announced plans for construction of a \$9 million ammonia plant at its Marcus Hook, Pa. refinery. To be completed late this year, plant will have capacity of 300 tons per day. Output of Sun's new plant is expected to find industrial application as a result of the plant's location in a highly industrialized area. Ammonia synthesis unit will utilize by-product hydrogen from catalytic reforming plants, one of which produces benzene, toluene, and xylene. Other catalytic reformer produces high octane gasoline components.

Ammonia plant to use gas from coke ovens

First American synthetic ammonia plant to be based entirely on coke oven gas is being built for Ketona Chemical Corporation, jointly owned by Alabama By-Products Corporation and Hercules Powder Company. Unit will have annual capacity of 45,000 tons of anhydrous ammonia when it comes on stream late this year. Installation will be located on sizable tract of land adjacent to two lakes and close by the Tarrant coke plant of Alabama By-Products Corporation which will supply coke oven gas as raw material. Contract for engineering and construction of the new ammonia plant has been awarded to The Fluor Corporation, Limited, of Los Angeles, Calif.

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**News about chemical materials in the US —
plant construction, increased production . . .
on stream now or planned for future**

**Newly-formed company plans
to make petrochemicals**

United Gas Corporation, Electric Bond & Share Company, and National Research Corporation are jointly financing a new company — Gulf Chemical Company. Gulf will manufacture and sell ammonia, ammonium nitrate, and other nitrogenous materials in addition to manufacturing and selling polyvinyl chloride.

Initial plant facilities are planned for Pensacola, Florida, at a cost of \$22,920,000. Working capital is estimated to require approximately \$3,880,000, bringing the total investment to approximately \$26,800,000. Natural gas for raw material will be purchased from United Gas Pipe Line Company, a wholly-owned subsidiary of United Gas Corporation. Ammonia facilities will be on stream by January, 1956, with polyvinyl facilities coming on stream in full production shortly thereafter.

**Virginia-Carolina Chemical's
plant now on stream**

Million dollar plant of Virginia-Carolina Chemical Corporation at Fernald, Ohio, is now in full-scale production. V-C's new unit is producing all grades of phosphoric acids, sodium tripolyphosphates, and tetrasodium pyrophosphates. Other chemical plants owned and operated by V-C are located in Charleston, S. C., and in Nichols, Florida.

**Ti sponge by Na reduction
planned by Union Carbide**

Union Carbide & Carbon Corporation has preliminary work underway on new \$31,500,000 titanium sponge production facilities at Ashtabula, Ohio. Plant, to be constructed by Catalytic Construction Company, is scheduled to produce 7500 tons of titanium sponge annually when it gets into production in 1956. Electro Metallurgical Company, a division of Union Carbide, will operate the installation. Process to be used

at the plant involves sodium reduction of titanium tetrachloride to produce high-quality titanium.

**Lithium expansion program
nears completion**

Kings Mountain, N. C., spodumene mine and concentrating facilities have been expanded by Foote Mineral Company. Increased tonnages of spodumene concentrates are moving to Foote's Sunbright, Va., plant for extraction of lithium.

Production of limestone, a basic process raw material from Foote's mine at Sunbright, has already been upped to balance the flow of spodumene. Recent boost in production makes Foote Mineral Company the nation's first large-scale producer of lithium chemicals.

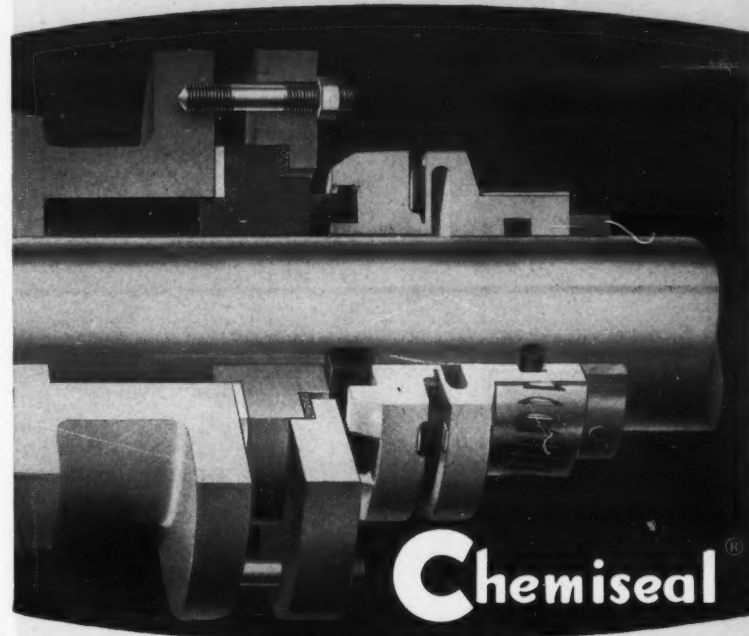
**Alcohol warehouse, more NH₃
plans for National Distillers**

In line with its expanding operations in the chemical field, U. S. Industrial Chemicals Co., division of National Distillers Products Corporation, has purchased 3½ acres for erection of facilities for warehousing and distributing alcohols and other chemicals. Newly-acquired site is on south side of Central Railroad of New Jersey overpass on Doremus Avenue in Newark, New Jersey.

Modern facilities will be installed for receiving bulk shipments by rail or water. Large storage tanks for 190 and 200 proof alcohol will permit prompt shipment of pure alcohol in all types of containers.

In addition to these new facilities, National Distillers has authorized Girdler Corporation to install natural gas reforming equipment at its Tuscola, Illinois, plant to expand its ammonia capacity to 60,000 tons per year by middle of 1955. National's Engineering Department is designing new denaturing units for Tuscola. New pilot plant building also is being constructed at Cincinnati. This unit, together with expansion of laboratory building completed in spring of 1954, will permit National to centralize its research at Cincinnati.

**Here is the Shaft SEAL
you have been wishing for**



**Chemically Impervious TEFLON
Balanced Bellows Design**

Three years of actual field tests have proven that Chemiseal external mechanical seals last longer and give unsurpassed performance under a wide variety of chemical service conditions—handling acids, alcohols, alkalis, hydrocarbons, and related chemical compounds including abrasive slurries and tarry material (with provisions for flushing).

Combining the Bellows design, which provides pressure balance so essential for long leak free service, with duPont TEFLON the wonder plastic for immunity to corrosion and contamination—United States Gasket engineers have produced a mechanical seal which makes "sealing" simple and economical for the process industries.

FEATURES

• **CHEMICALLY IMPERVIOUS** TEFLON Bellows section. A selection of seal face

materials dependent upon medium and service requirements.

• **SEAL ROTATES WITH SHAFT** Only bearing surface is between precision ground rotating and stationary seal faces. Low friction load on shaft. Lower power cost. Drop tight service.

• **NO SCORING OF SHAFTS** and Chemiseals work satisfactorily on shafts previously scored by other seals or packing.

• **LIFE EXPECTANCY** many times that of other seals or packing.

• **PRESSURES** at the seal up to 100 psi at 75°C or 75 psi at 100°C.

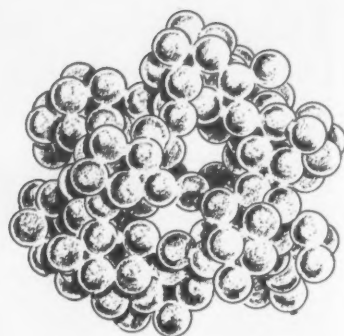
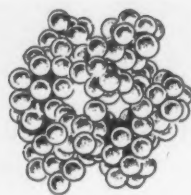
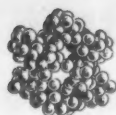
• **SIZES** from ¼" to 2½". Other sizes for special applications.

• **MAXIMUM LENGTH**, all seals 2½".

Write for Bulletin No. MS-954.

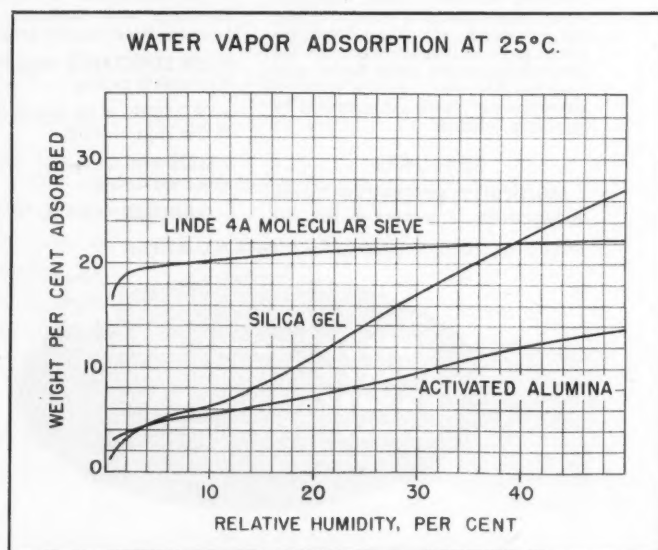


When inquiring check CP 4529 on handy form, pgs. 2-3

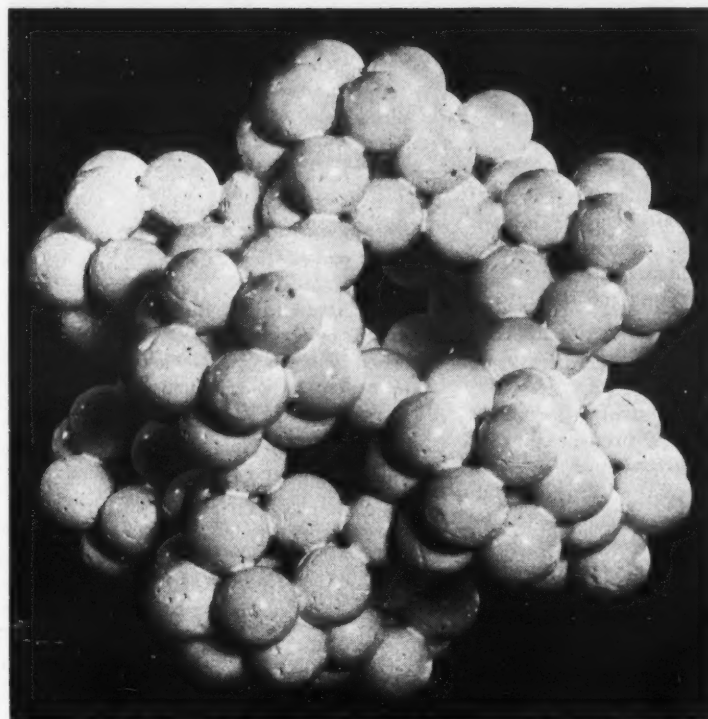


Offering opportunities to broaden applications of adsorption —

"molecular sieves" separate gases, liquids



Graph shows that zeolite adsorbent has almost five times drying capacity of either activated alumina or silica gel, when water is present in low concentrations



Model of molecular sieve crystal shows how arrangement of atoms (sodium, calcium, silicon, aluminum, and oxygen) forms pores opening into single cavity

Adsorbents have high capacities and selectivities, are easily reactivated, withstand elevated temperatures

Representing a big step toward greater use of adsorption in large-scale industrial operations, new synthetic zeolite adsorbents can separate liquids and gases on basis of difference in molecular size. Called "molecular sieves", material's crystalline structure contains large number of small cavities interconnected by smaller pores. Cavities have strong adsorptive tendencies, but only those molecules that are small enough to pass through pores can enter cavities — hence the name, "molecular sieve".

Two types are available. The first, Type 4A, has pore opening of about 4 Angstroms diameter (adsorbs only molecular smaller than this size). The second, Type 5A, has pore opening of about 5 Angstroms in diameter. Each of the two types is available in three different sizes, or forms — ranging from fine crystalline powder to 1/8-inch diameter pellets.

One of product's most useful properties is capacity to adsorb large quantities of a material that comprises only a small part of a mixture of gases or liquids. Type 4A will adsorb 19 per cent of its own

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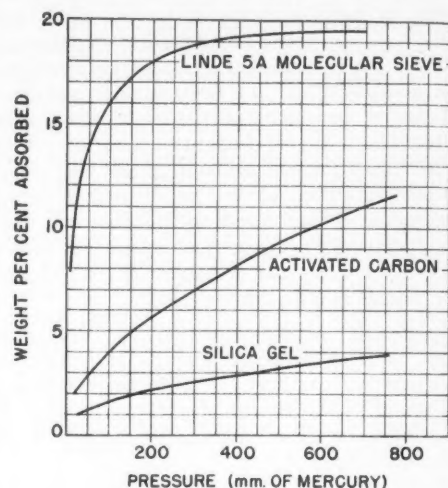
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CARBON DIOXIDE ADSORPTION AT 25 °C.



Absorbents are well suited for removing carbon dioxide from air

weight of water from a gas that has 2 per cent relative humidity. This is about five or six times as much water as can be adsorbed by other adsorbents.

Sieves are capable of adsorbing material quickly. Speed makes it possible to process more material with less adsorbent (in a given space), thereby reducing processing costs. Rapid adsorption may also make it feasible to use continuous adsorption processes.

Absorbents show marked affinity for chemically unsaturated molecules. Ethylene, acetylene, propylene, and butylene can be separated quite simply from saturated molecules of approximately the same size. It is possible to separate many straight-chain hydrocarbons from cyclic and branched-chain hydrocarbons. In benzene separation, 99.9 per cent was recovered from mixture containing 5 per cent n-tetradecane. When reclaimed from adsorbent, latter was also 99.9 per cent pure.

Other industrial applications include gas purification, drying of gases and liquids, ion exchange, dessicants, and recovering gases from waste gas streams. Adsorbents can be reactivated and used over again. Adsorbed material is driven off by heating and can be reclaimed. Adsorbent bed should be purged and cooled before reuse. Material can be heated up to 1100°F without serious damage.

(Molecular sieves are development of Linde Air Products Company, A Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, New York . . . or for more information reader may simply check CP 4530 on convenient Reader Service slip located between pages 2 and 3.)

announcing the NEW STRONG

STEAM TRAPS



GREATER CAPACITY
LOWEST MAINTENANCE
UNMATCHED OPERATION
ON LIGHT LOADS

Here is a new standard of performance in steam traps — Strong "Hydro-Flex".

This completely new line of low, medium and high pressure steam traps combines high discharge capacity with high efficiency under all condensate loads. The built-in flexibility can mean lower steam and maintenance costs plus higher production.

Strong "Hydro-Flex" meets the need for a trap that operates efficiently on light condensate loads. Under normal plant conditions many traps actually function at less than 1% of rated capacity. Strong's "Hydro-Flex" design makes possible high discharge rates

when required, yet ensures unequalled performance on low loads. This new concept in steam traps is the product of five years of development work and 50 years of steam trap experience.

Take advantage of this new, better standard of steam trap economy — standardize on Strong "Hydro-Flex". For complete details, contact your local Strong distributor or write for new Catalog No. SS-40.

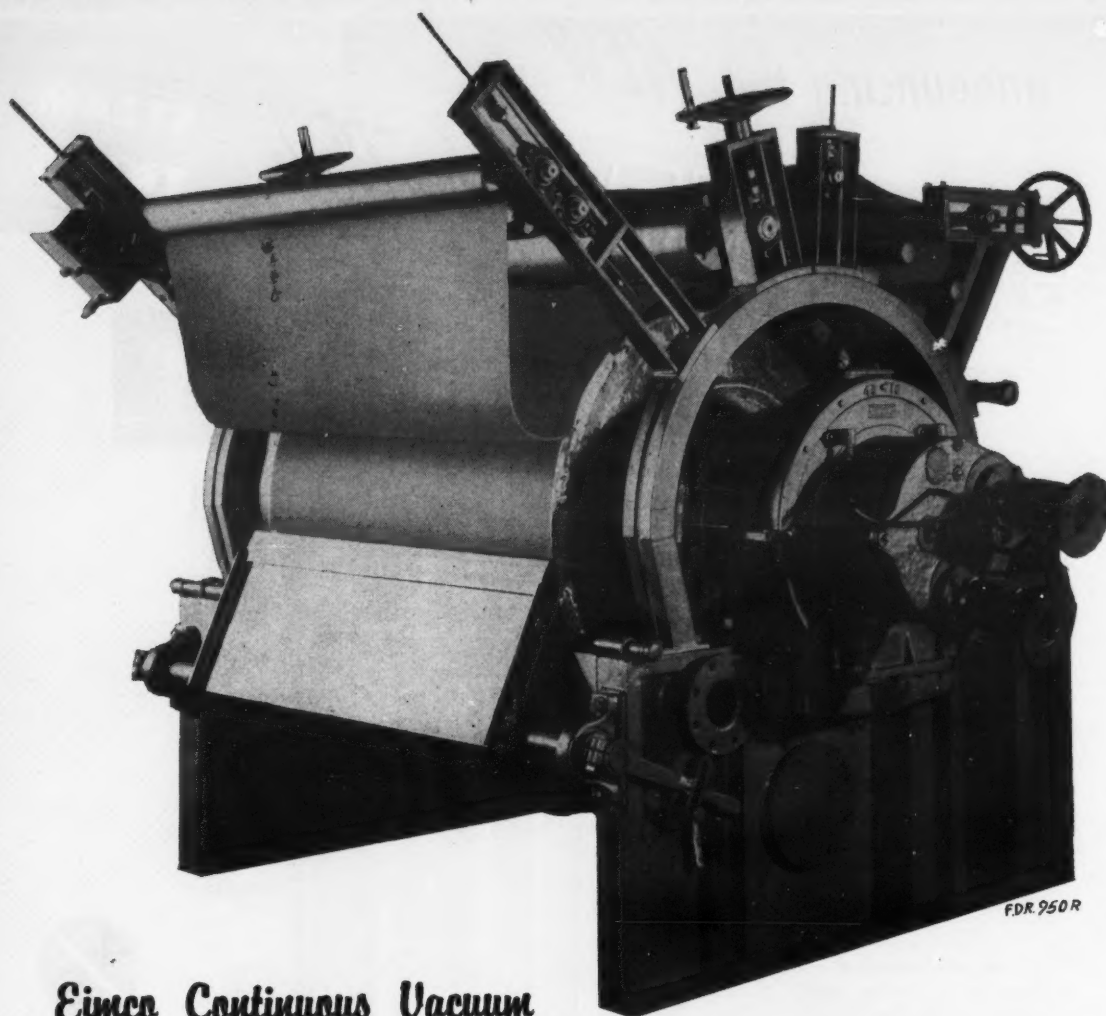
STRONG, CARLISLE & GAMMOND CO.
1822 WEST 2nd STREET • CLEVELAND 12, OHIO

STRONG
HYDRO-FLEX
STEAM TRAPS

high efficiency under all condensate loads

Available from over 200 industrial distributors in the United States, Canada and foreign countries.

When inquiring check CP 4531 on handy form, pgs. 2-3



Eimco Continuous Vacuum Filters Using Compression Blankets

Another example of the many types of Eimco Continuous Vacuum and Pressure Filters. Filters of this type have been in use in many plants and provide many advantages where the material to be filtered produces a flocculent solid type cake.

Eimco filters of the type shown above, introduce a wash spray to the cake formation immediately after it emerges from the liquid in the tank and the compression blanket binds the cake to drum within a few inches of the slurry level. The blanket covers the cake to the blow zone above the scraper blade.

This type Eimco filter prevents cake cracking, greatly improves washing and on some types of filter cake, will reduce moisture content in the cake by 8-10%.

Write for more information.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

You Can't Beat An Eimco!



IDEAS

Warehouse costs go down as ceilings go up . . .

increasing height of one-story structure is less expensive than horizontal expansion

Going to build a new warehouse? Then plan carefully or you may be disappointed. Innumerable mistakes are possible but perhaps the most common and costly are: 1) Emphasizing appearance and luxury instead of function; 2) Visualizing capacity in terms of footage instead of cubage; 3) Retaining manual methods rather than adopting mechanization; 4) Too much mileage in performing in-and-out handling of shipments. Such errors explain why some new warehouses cost so much to construct and operate in relation to what they return in efficient service.

In planning, the first question is: "How many floors should a warehouse have?" The answer is: "Just one!" This answer is in line with a popular and sound trend. Some of the best basic plans and innovations are found among the many new one-story warehouses.

Disadvantages eliminated by one-story structure are quite apparent. Multi-story buildings depend on inadequate vertical communication. Main floor can rarely be used for storing — usually being limited to moving goods in and out. All building codes require stair wells, elevators, and other facilities that spoil twice as much footage as they use.



Increased ceiling clearance to a total of 20' provides additional space at much lower cost than horizontal construction

With an elevator well, four times as much footage is lost as the area occupied by the elevator itself. Single story structures avoid these facilities and space losses, also effect labor savings up to 33%.

However, to gain full benefit from one-story structure, capacity must be considered in terms of cubage instead of footage. Cubage costs less than footage and therefore can have real influence in holding down construction costs in terms of actual storage space. A warehouse built for \$6.00/sq ft, with a clear height of 15 ft, costs 40c/cu ft. By raising the clear height to 20 ft, five more feet are added yet the total cost of the structure will be only a trifle over 30c/cu ft. Capacity is thus increased 33% while building costs rise only 5%.

The reason for using every available square and cubic foot may seem obvious but when viewed in terms of construction costs it may take on a new meaning. In the early post-depression decade good warehouses were built for \$1.50/sq ft, with a rental equivalent of 15c/sq ft/yr. By 1940 the costs had jumped to \$2.50, while rentals doubled. In 1950 a typical low-cost warehouse in Philadelphia cost \$4.60/sq ft with rental rate being 50c. Now, 1954 construction cost is up to \$7.00 in Metropolitan areas with rental proportionately high.

This ever upward trend can be combated in two ways: by using low-cost building materials and stretching them, producing more space for little more money, and by using operating plans that make the space work better.

Extra space gained, however, cannot be used to full advantage if muscles are employed instead of machines. If all movement in typical warehouse work were manual, each case would have to be handled up to six times. However, palletized cases are handled only two or three times. With machines speeding operations, it is possible to utilize maximum cubage. Illustration shows how fork lift trucks stack pallets to maximum height.

Mileage that must be traversed in any warehouse can be reduced by good basic floor plan, and systematic arrangement of stored goods according to type and frequency with which they must be moved.

(From a report by James M. McKay, Partner, Ballinger-Meserole Co. Warehouse design is a service of Ballinger-Meserole Co., Dept. CP, 121 N. Broad St., Philadelphia 7, Pa. . . . or for more information check CP 4533 on handy form, pages 2 and 3.)

Packaged water treatment plant pictured and described

Packaged water treatment plant is described in four-page folder. Heart of plant is high-rate, self-contained softener and clarifier. Folder has cut-away view of plant.

Reprint T-126 is issued by Graver Water Conditioning Company, A Division of Graver Tank and Manufacturing Company, Inc., Dept. CP, 216 West 14th Street, New York 11, New York. Specify CP 4534, pages 2 and 3.



It's my job to prevent trouble! That's why I consider "KARBATE" products wherever corrosion is a factor.

Do You Know...

- . . . that "Karbate" impervious graphite is inert to a greater range of corrosive conditions than any other widely used material of construction?
- . . . that the price of "Karbate" equipment compares favorably with those of less corrosion-resistant materials?
- . . . that standard designs of "Karbate" equipment take full advantage of this material's high compressive strength to assure ruggedness beyond the toughest service requirements?
- . . . that "Karbate" brand impervious graphite — the original and most widely used brand — is manufactured exclusively by National Carbon Company?

Don't wait until other materials fail — consider "Karbate" impervious graphite equipment *right from the start* when building a new plant or expanding present facilities. Our technical and engineering staffs are at your service.

TEST YOUR KNOWLEDGE OF KARBATE BRAND IMPERVIOUS GRAPHITE EQUIPMENT

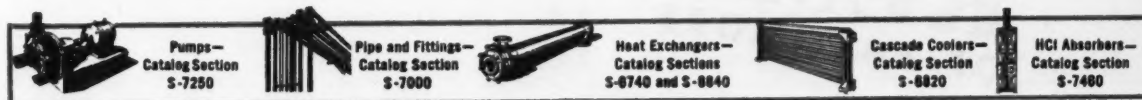
The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco

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When inquiring check CP 4535 on handy form, pgs. 2-3

Case No. 63

Kemp Oriad Dryer Gives
"Most Satisfactory
Service" Guarding
Spencer Control Board



How Kemp assures round-the-clock operation at Spencer Chemical

The Spencer Chemical Co., Charlestown, Ind., operates 24 hours a day, 7 days a week, making nitrogen compounds for the fertilizer industry. Heart of this operation is the master instrument board that controls all plant processes. These instruments are operated by compressed air, which must be dried to prevent rust and corrosion within the controls.

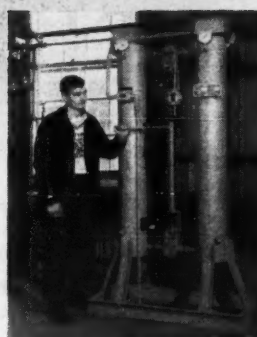
Kemp Offers Continuous Protection

Spencer uses a Kemp Oriad Dryer to dry all the air required and completely protect the delicate instruments from moisture damage. Since its installation in 1950, this Kemp unit has needed no service of any kind. And Spencer is delighted with Kemp's ease of operation! Mr. N. S. Whitaker, Works Manager, commenting on Kemp's

"most satisfactory service," says, "Operation is simplicity itself. All we have to do is switch a lever once a week. Capacity is ample for one week of maximum flow, on a 24-hour 7-day operation."

Kemp Dryers for Every Purpose

Kemp offers a variety of dryer models to meet all problems. Designed to dry air to sub-zero dew points at low cost, these efficient dryers embody the engineering knowledge gained from Kemp's many years of experience. They are available with manual, semi-automatic, or fully automatic tower reactivation. In addition, Kemp will prescribe the proper desiccant for each specific drying job. If you have a problem involving the drying of air, gases, or liquids, contact Kemp engineers now.



Only operation required on Kemp Oriad Dryer is moving lever once a week to switch flow of air to second column. First column is reactivated by heat during the week.

For more complete facts and technical information, write for Bulletin D-27 to: THE C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP
OF BALTIMORE



DYNAMIC DRYERS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • INERT GAS GENERATORS
SINGING EQUIPMENT

When inquiring check CP 4536 on handy form, pgs. 2-3

IDEAS

Utility savings of 50% possible after audit and survey

How utility audit and survey can be of benefit to users of gas, electricity, water, or steam is explained in 16-page report. Because rates are affected by economic conditions, type of consumer, load, and other factors, it is important that consumers inform utility company when they make changes in equipment. Changes affecting rates may consist of new machines, air conditioning, larger motors, retooling, new lighting, etc.

Number of case histories are cited. Surveys are reported to have reduced utility costs in many cases from 1 to 30% — and sometimes as high as 50%. Service includes determining lowest applicable rate, advising of incorrect interpretations of utility contracts, overcharges, incorrect method of metering, and misapplication of rate schedules.

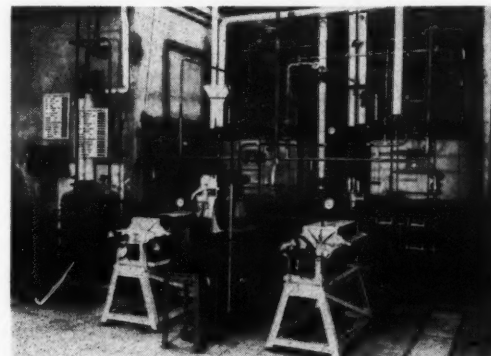
"The Rateonics Story" is issued by Rateonics Corporation, Dept. CP, Rateonics Building, Pacific at Live Oak, Dallas 1, Texas. When inquiring specify CP 4537 on convenient Reader Service slip located between pages 2 and 3.

Ample supply of new antibiotics cuts testing time in Belgian research center . . .

modern plant quickly produces quantities necessary for large-scale evaluations

The time usually necessary for thoroughly testing new antibiotics has been reduced considerably at new Belgian antibiotic research center. Linked with the Institute of Bacteriology, Liege, Belgium, center is reported to be one of the largest of its kind in the world.

Plant includes all standard research facilities plus substantial unit for producing sufficient quantities of experimental antibiotics for wide-scale testing. Included are temperature-controlled nutrient tank



Portion of plant for producing antibiotics

system, fermentation section, filter and centrifuge system, vacuum filtrate evaporation, flexible solvent extraction tower system, facilities for chromatographic adsorption, freeze drying, and batch distillation.

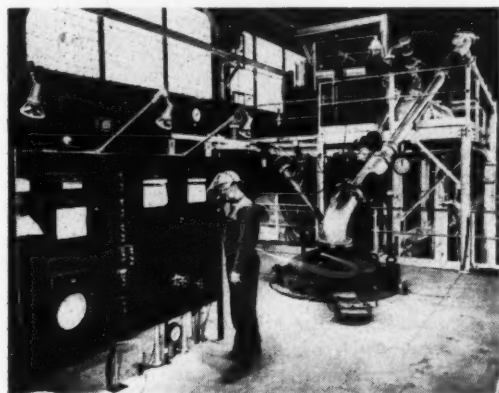
Months usually spent in sample preparation are shortened to a matter of weeks. Chances of releasing dangerous or futile antibiotics are reduced by the large-scale testing technics.

Secondary objectives of plant are work in experimental genetics, agricultural research, and the creation of training program for advanced students of microbiology and antibiotic therapy.

(Research center was engineered by Scientific Design Company, Inc., Dept. CP, 2 Park Avenue, New York 16, N. Y. . . . check CP 4538, pages 2 and 3.)

New plant to produce titanium at rate of 7500 tons/yr

Capable of producing at least 7500 tons of titanium metal per year, new \$31 million plant will soon be built at Ashtabula, Ohio. Plant will produce the metal by the Electromet process — sodium reduction



Pilot plant has been producing titanium by new process. Large plant will be completed in 1½ years

of titanium tetrachloride. This will be first commercial production of titanium by a method other than Kroll process.

Process has been under development by Union Carbide and Carbon Corporation for past five years. Company has had pilot plant and prototype plant scale in operation at its metals research laboratories.

Completion of plant is expected in about a year and a half. For a five-year period, Government will take (at prevailing market prices) part of plant's output not sold to private industry.

(Plant is being built by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, Dept. CP, 30 East 42nd Street, New York 17, New York.)

Welding Copper



Inert gas shielded metal arc welding of new copper shell for rebuilt tower.

SAVES 38% in materials and labor for joining

Some time ago, the Tennessee Eastman Company, Kingsport, Tennessee, a Revere customer, began to rebuild some of its copper stills or fractioning towers, which previously would have been silver-brazed. Revere's welding specialists were called in to see whether or not welding would be superior. Demonstrations were made to Tennessee Eastman engineers and shop personnel, with the result that welding was adopted. Actual experience in the shop shows a saving of 38% in materials and labor for joining, and a better job in every way. The welding method used is the inert gas shielded metal arc process.

Reconstruction of the towers was made to reduce the number of flanges. At the same time Tennessee Eastman changed from the flange joint tray construction to the inserted tray type and incidentally, reduced the number of gaskets with their accompanying maintenance problems. The trays are salvaged by shearing off the bolt hole circle and folding up the edges. The towers are some 45' high, 6' to 10' in diameter, with a tray or bubble cap plate at

specified intervals. Tennessee Eastman plans to rebuild several towers a year in this economical way.

It will pay you as it did Tennessee Eastman to look into welding as a modern method of joining copper. Remember Revere is fully experienced in the most modern and efficient methods, and will collaborate with you on their application.

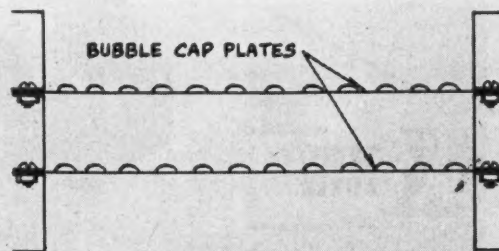
REVERE

COPPER AND BRASS INCORPORATED

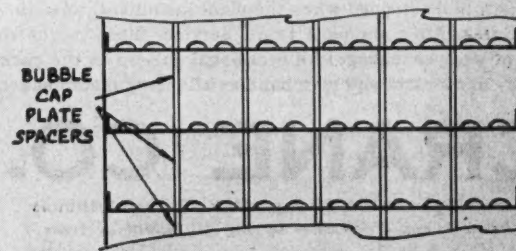
Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

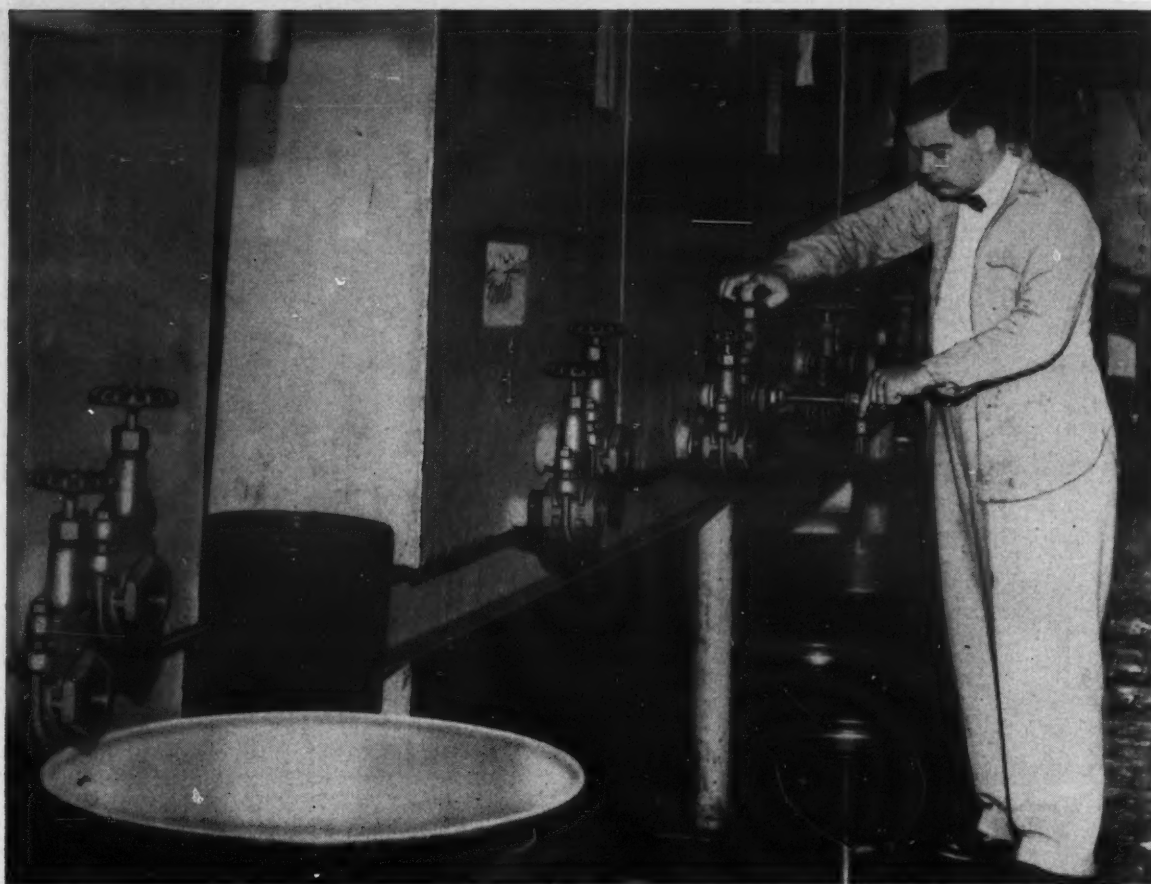


Section through old tower, showing bubble cap plates held in bolted flange.



Section through new welded tower. Bubble cap plates have had bolt holes sheared off, edges turned up. They are held in place by spacer rods.

When inquiring check CP 4539 on handy form, pgs. 2-3



Leakage troubles here stopped by these CRANE VALVES

THE CASE HISTORY—Read why Hysan Products Co., Chicago, changed to Crane Clamp Gate Valves in all process and storage piping. Hysan makes liquid waxes, pine oil and coal tar disinfectants, liquid soaps, and similar chemical specialties.

Valves formerly used were similar to Crane Clamp Gates, but only in appearance. They lasted no more than 2 to 6 months—leaking at seats and disc with no more than 3 to 12 operating cycles daily. Maintenance and replacement costs mounted—as did down-time losses. The leaky valves on tank lines forced repeated transfer of storage stocks. As many as 3 men were needed to make valve repairs.

All this trouble stopped when the plant installed Crane No. 488 Clamp Gates. After almost 2 years' service, these valves show no sign of wear or leakage. An occasional pull-up on the packing is all they need—and one man handles all piping maintenance.

CRANE CO.

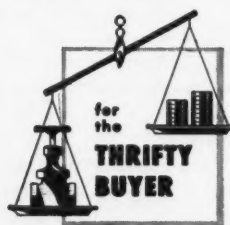
General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
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VALVES • FITTINGS • PIPE • PLUMBING • HEATING

CRANE'S FIRST CENTURY . . . 1855-1955

CRANE CLAMP GATE VALVES

Rugged design with careful, close tolerance machining, especially on seating surfaces, sets these Crane valves apart from others. They give long-lasting tight closure under frequent operation and on hard-to-hold fluids. Many patterns to choose from—all-iron or brass-trimmed. See your Crane Catalog or Crane Representative.



IDEAS

Host of vapor-barrier uses for aluminum/Mylar lamination . . .

where applied, insulating material eliminates condensation, gives corrosion protection

A vapor barrier, with the strength of polyester film and the imperviousness to moisture of aluminum, has been created by laminating a one-mil sheet of aluminum foil between two half-mil sheets of duPont's Mylar. Resultant tough, flexible insulating material can be used as a vapor barrier for refrigeration insulation, as a protective covering for pipes, and as a barrier material for special packaging.

As a refrigeration insulation, the barrier material, called Zero-Perm, reduces entry of moisture vapor to such a minute degree that condensation problems are virtually eliminated. Material is so flexible that joints can be easily lapped and sealed with an adhesive by hand pressure.

Mylar-aluminum combination also provides moisture-proof protection for pipe insulation exposed to corrosive atmospheres. Material can be bonded directly to primary insulation, protecting both insulation and pipe. Even underground piping, insulated or not, is afforded good protection.

This lamination also answers the need for a vapor-proof envelope used as a barrier material for packaging delicate equipment and chemicals requiring dehumidified storage. Sealed joints of this package are unaffected by creasing or handling, and the barrier material can be reused.

(Vapor-barrier material is a product of Alumiseal Corp., Dept. CP, 385 Madison Ave., New York 17, N.Y. . . . or for more information check CP 4541 on handy form, pages 2 and 3.)

(A somewhat similar insulation is undergoing tests at the new Circleville plant of duPont. In this case, Mylar is bonded first to aluminum foil and then to paper. The resultant material is used to protect primary insulation from moisture contamination, thus maintaining its insulating effectiveness. Asbestos paper is another material being used in combination with Mylar, as a protective covering for hot pipe insulation.)

Still another use for Mylar, as a liner permitting handling of corrosive liquids in fiber drums, was discussed previously in these columns — November **CHEMICAL PROCESSING**, p 156.)

"Determination of Pipe Thrust." Nomograph
on pages 158-160

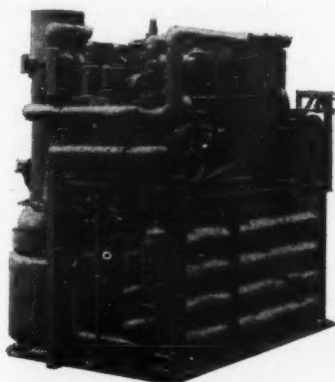
When inquiring check CP 4540 on handy form, pgs. 2-3

IDEAS

CO₂ continuously removed from atmosphere aboard atomic sub

To assure non-toxic atmosphere aboard the atom-powered submarine Nautilus, air is passed through carbon dioxide removal unit when ship is submerged. Designed around Girbotol process, unit has high capacity for absorption of carbon dioxide in relation to its size, weight, and volume of absorbent.

Passing through absorber column, air meets countercurrent stream of the absorbing medium, which re-



Carbon dioxide removal unit assures non-toxic atmosphere

moves the carbon dioxide. Absorbent is reactivated in separate vessel.

Carbon dioxide is released from reactivator, with some rejected steam, by application of heat in reboiler. Compressed, it is exhausted into sea where it dissolves and leaves no bubbles to reveal ship's position. Heat of compression is recovered in reactivator boiler before carbon dioxide is expelled.

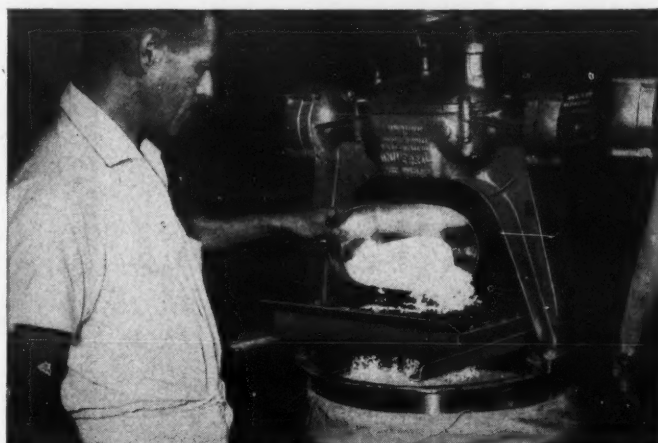
Unit is fabricated mainly of thin-wall stainless steel. Small remaining portion is of copper nickel alloy.

(Carbon dioxide removal unit was built by The Girdler Company, a division of National Cylinder Gas Company, Dept. CP, 224 East Broadway, Louisville 1, Kentucky.)

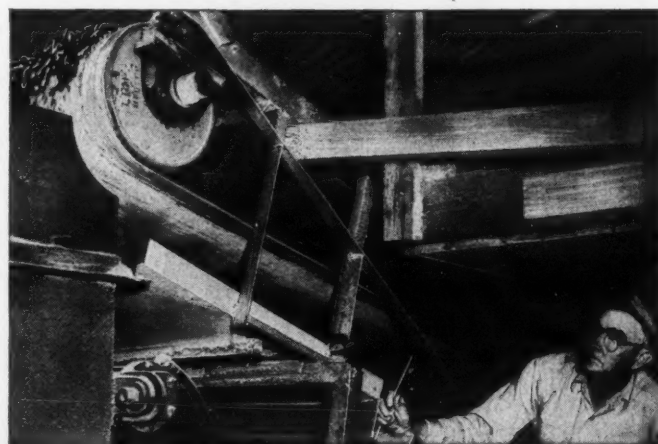
For more information on product at right, specify CP 4542 . . . see information request blank between pages 2 - 3.

UPSIDE-DOWN ROLLER DERBY? Not at all. The young lady is demonstrating the tremendous power of an Eriez Magnet. Seventeen times stronger than old magneto magnets, the power of new Eriez Magnets has given ideas about getting rid of dangerous tramp iron . . . which causes fires, machinery damage and product contamination . . . to every form of industry. All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments. Best of all their magnetic power lasts a lifetime. The first cost is the last.

MAGNETIC IDEAS FROM ERIEZ



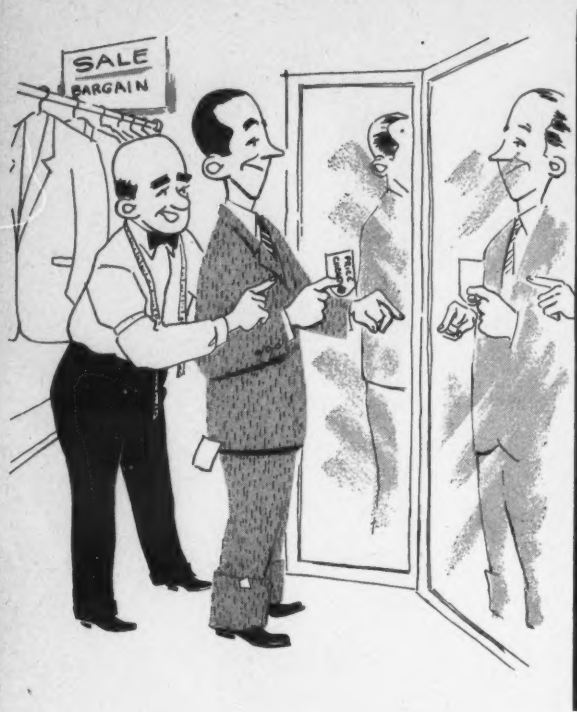
GRATE MAGNET DOES GREAT JOB ON RIDDLE. Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N. Y., producers of drugs and chemicals, recently installed an Eriez Permanent Grate Magnet over a riddle used to sift powders. Although there previously had been occasional traces of contamination in the powder due to minute ferrous particles (in some cases invisible to the human eye) the finished product is now completely free of metal contamination. Even microscopic particles of metal have been removed from the powder by the powerful action of the Eriez Grate Magnet.



NEW IDEA FOR LABOR SAVING is the latest "brain child" dreamed up by Eriez. Called *Magnalarm*, the new unit combines a plate magnet with a signalling device which automatically sets off an alarm when the magnet becomes loaded with tramp iron and needs cleaning. Needless inspections are saved. Needless machinery shutdowns prevented. *Magnalarm* provides the guarantee that magnetic units are never overloaded . . . always working at top efficiency. Want more information on this product? . . . request Bulletin B-604.

GUARDING EQUIPMENT AGAINST TRAMP IRON. Cal-Compac Foods, Inc., Santa Ana, Calif., processor of dehydrated and ground peppers, protects its valuable 100 hp hammermill . . . and even more valuable reputation for product purity . . . with an installation of an Eriez Magnetic Pulley on its inspection belt. Peppers brought to the plant directly from the field naturally pick up stray iron. The Eriez Magnet cleans out this dangerous tramp iron from the peppers at the rate of about 5 lbs. per day!

Eriez "Magnetic Ideas" can help you. Eriez' factory-trained field men, backed by Eriez' laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey and offer helpful "Magnetic Ideas". Write or call Eriez Manufacturing Company, 73N Magnet Drive, Erie, Pa.



he was saving money until...

A brief shower washed out his presumed bargain—
but he should have expected rain sometime.

another record
to shoot at:

A certain pharmaceutical manufacturer hasn't spent a penny for repair parts in more than three years since he purchased the first of the eight LaBour Type G pumps he now operates.

Don't laugh—it can happen to you. Not with clothes, probably, but how about your chemical pumps?

"Bargain" pumps that let you down in an emergency—and every chemical plant expects emergencies—aren't very profitable. Nor is it a bargain when you have to buy the pump over and over again in replacement parts.

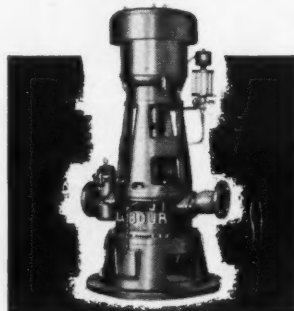
LaBour Type G pumps are *genuine* bargains because they cost a great deal less in the long run. You spend less for replacement parts, less for labor to do the replacing, and you have less loss of production because your down time is low or non-existent.

That's no mere claim. It's a fact we can prove if you'll only give us the opportunity. Say when.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. • ELKHART, INDIANA, U.S.A.



When inquiring check CP 4543 on handy form, pgs. 2-3

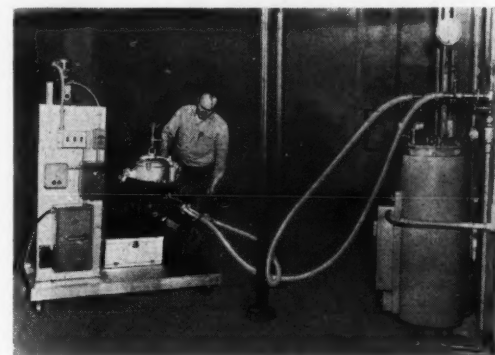
IDEAS

Mobile unit reclaims lube oil while engines run . . .

water and solids removed by centrifugal action; engine life extended, downtime cut

Without interrupting operations, water and other impurities are removed from lubricating oil of engines that drive generators, blowers, and other equipment at East Rockaway, L. I., sewage treatment plant. Oil is fed directly from the crankcase of running engine into a compact, mobile separator, where it is cleaned by centrifugal action and returned to the crankcase. Unit can be used for cleaning fuel, flushing, and other industrial oils in addition to the lubricating oils.

Mounted on a four-wheeled steel frame dolly, the separator consists of a centrifuge, motor, two pumps, heater, and control panel. Power is derived from 440-volt, 3-phase, 60-cycle AC source. Centrifuge has capacity of 130 gph when handling fuel oil and



Maintenance engineer checks temperature of inflowing lube oil on mobile separator

averages about 65 gph with lube oils. Throughput depends upon amount of solids, specific gravity, and viscosity of oil. Sludge capacity of bowl, which turns at 10,000 rpm, is about two pounds.

One of the pumps draws oil in and feeds it to thermostatically controlled 6-kw heater. Oil is heated to 170-190°F to produce proper viscosity for separations. Passing through temperature check point, oil is next fed into the centrifuge where solids and water are removed. Second pump discharges the oil to the crankcase.

Separator extends engine life, reduces downtime, and increases filter-pack life where filters are used. Units are made in various sizes, ranging in capacity from 50 to 2500 gph.

(Westfalia centrifugal separators are product of Centrico Inc., Dept. CP, 75 West Forest Avenue, Englewood, New Jersey . . . or for more information concerning the manufacturer's product, reader may simply check CP 4544 on convenient Reader Service slip which is located between pages two and three.)

Metallic all soluti

different
voltage

The addition of metal powder to electrical systems that they AC voltage. The phenomenon long as remains.

No two qualities said to Fluids may be analyzed with

Material blended with metals are used with the powder

Mixing a metal into will produce 0.5 volt about a Readings and more juice, been (Chemall of Chem CP, Santa

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For more ict at rig see blank betw

IDEAS

Metallic powder electrifies all solutions . . .

different liquids show different voltage, current readings

The addition of a small amount of metal powder to liquids is reported to electrify solutions to the extent that they will yield both DC and AC voltage and current indications. The phenomena will continue as long as any liquid or moisture remains.

No two types of liquids or two qualities of the same liquid are said to give the same readings. Fluids may be identified or analyzed with an electrical meter.

Material is derived from zinc blended with other metals. These metals are cleaned and homogenized with muriatic acid to produce the powder.

Mixing a half teaspoon of the metal into a half glass of water will produce a meter reading of 0.5 volt DC or AC, at current of about a quarter of an ampere. Readings are less for petroleum and more for sea water, milk, grape juice, beer, and similar liquids.

(Chemalloy metal is development of Chemalloy Associates, Dept. CP, Santee, California.)

Tells benefits possible from water survey

Value of broad approach to industrial water problems through an overall survey of process water is outlined in six-page folder. Literature gives examples of how survey to find out how water is being used — or wasted — in a plant can be beneficial.

"Water in Process Use" is issued by Hall Laboratories, Inc., Dept. CP, Hagan Building, 323 Fourth Ave., Pittsburgh 30, Pa. Specify CP 4545, pages 2 and 3.

For more information on product at right, specify CP 4546 . . . see information request blank between pages 2 - 3.



Enough heat to scorch an ordinary motor winding

When sudden high heat sears ordinary motor windings too often, the electrical insulation gives out . . . the windings short-circuit and production stops.

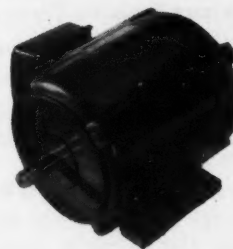
This damaging heat is caused on many motor applications by unexpected, temporary, high load demands. Such peak loads can produce gradual insulation decay in ordinary motors or cause rapid, destructive burnouts. Life-Line® "A" motors lick this problem with a new fortified insulation system.

First, the Life-Line "A" motor coils are wound with copper wire specially protected by BONDAR, a new heat-resistant, synthetic resin. *Second*, each slot cell is made with MYLAR* polyester film and is bonded to a reinforcing base. *Third*, the completely wound stator is given multiple dips and bakes in BONDITE, a silicone-reinforced thermoset varnish that has outstanding resistance to water, oil and chemicals. The result is an insulation system that provides longer motor life and fewer application restrictions.

It's another example of the way operating and maintenance costs are lowered by major improvements in motor design and performance pioneered by Westinghouse.

*Du Pont Registered Trade-Mark

Life-Line A



YOU CAN BE SURE...IF IT'S
Westinghouse



J-21723-A

INTER-RED PHOTO OF MOTOR WINDING, WHOSE INSULATION HAS BROKEN DOWN DUE TO OVERLOADING



- ★ Both Chemically Resistant and Impact Resistant Types
- ★ Half the Weight of Aluminum, with High Tensile Strength
- ★ Readily Formed, Machined, Drawn, Molded or Welded

AVAILABLE FORMS

SHEETS... $\frac{1}{8}$ " through 1". PIPE... $\frac{1}{2}$ " through 8" diameter (10 or 20 ft. lengths). ROUND BARS... $\frac{1}{4}$ " through 5" diameter (10 ft. lengths). WELDING ROD... $\frac{1}{8}$ " and $\frac{5}{16}$ " diameter.

TYPICAL APPLICATIONS

A rigid non-plasticized polyvinyl chloride, Van-Cor is fabricated into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

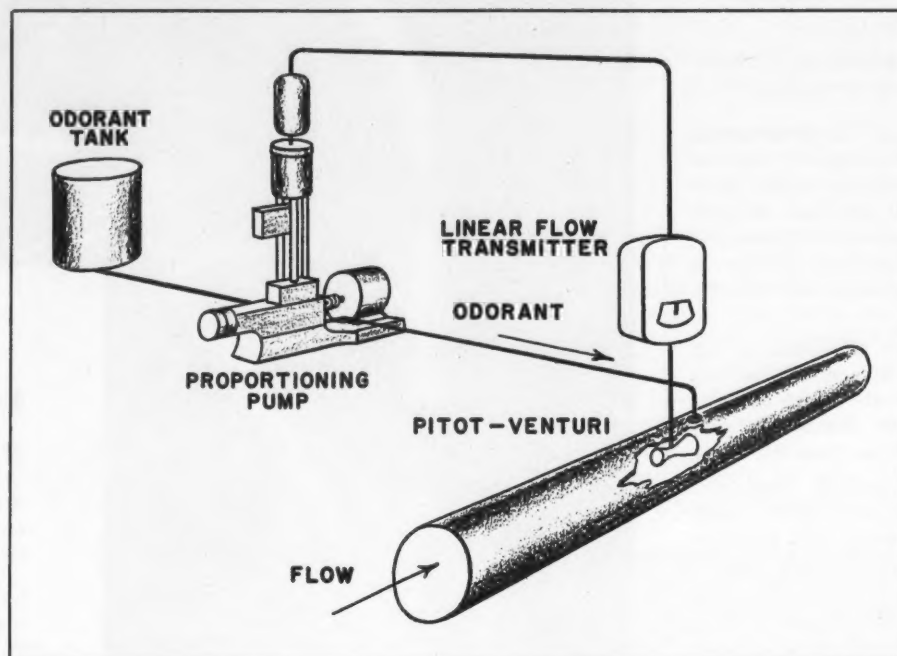
WRITE FOR ILLUSTRATED BULLETIN, SPECIFICATIONS, AND NAME OF NEAREST DISTRIBUTOR

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
2685 EAST 79th STREET • CLEVELAND 4, OHIO

When inquiring check CP 4547 on handy form, pgs. 2-3

IDEAS



At odorization station on natural gas pipeline

automatic system replaces full-time operator

H. L. CLINE,
Assistant Superintendent, Compressor Stations
Transcontinental Gas Pipe Line Corporation
with BRUCE FADER, Associate Editor

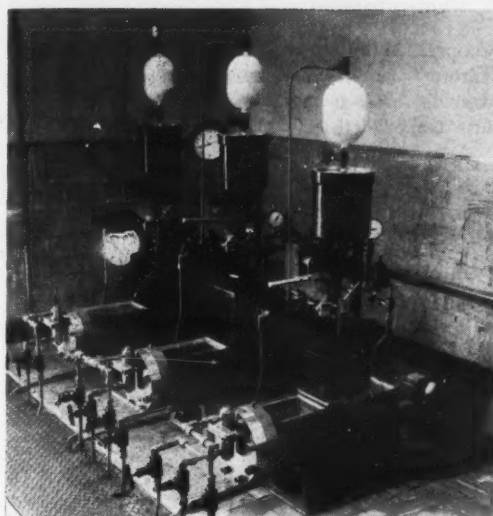
Problem: Since 1931 when the Bureau of Mines studied problems of gas odorization, it has been common practice to introduce an organic sulfur compound to give natural gas its characteristic "gassy" smell. Transcontinental Gas Pipe Line Corporation operates about 60 of these odorization units. Largest is near Malvern, Pa. It replaces a station near Downingtown.

At Downingtown, two main problems decided design of the Malvern plant. First, packing of posi-

tive displacement pumps could not be kept tight. Leakage of odorant was a public relations problem. Second, since pumps were manually controlled (variable piston stroke), a full-time operator had to match odorant rate with gas rate. Labor requirement came to four men for operation and maintenance.

Solution: Odorizing all gas sold in the Philadelphia-New York area, the Malvern station is rated at 500 million cubic feet per day. Odorant is injected directly into main gas flow on discharge side of the station. This is a 30-inch main operated at 750 psi.

A 14 x 16 ft building houses controlled volume pumps and accessory equipment. Pitot-Venturi flow element in main produces a signal proportional to square root of flow. This signal is used by a pneu-



Three proportioning pumps installed at Malvern Station

matic transmitter equipped with square root converter and pressure compensator to produce a linear output with respect to gas flow. This output controls feed rate of the controlled volume pumps.

Controlled volume pumps have adjustable stroke while running. Thus odorant feed rate can be matched to gas flow. Using a positive displacement piston, controlled volume pump also incorporates a sealed-end feature since a diaphragm separates odorant from any moving parts. Thus the principal source of leaks is eliminated.

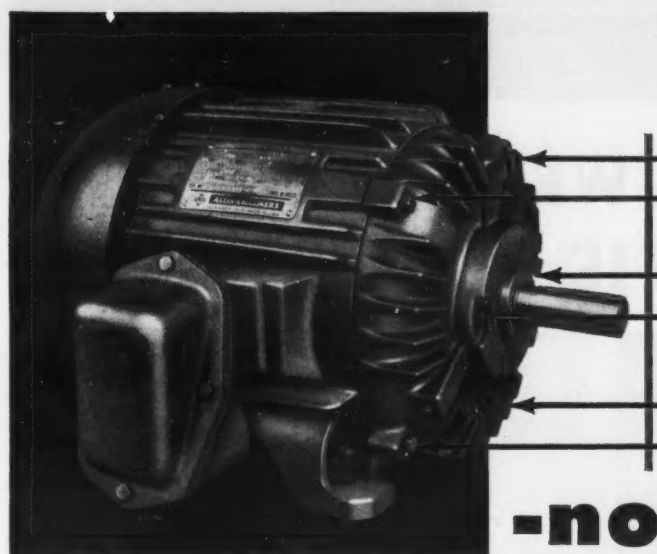
A three-months' supply of odorant (5000 gallons) is purchased in bulk and stored in five underground steel tanks. From steel tanks odorant is transferred by gas pressure to a three-day supply tank located inside equipment house.

Results: Operation is now fully automatic. Adequate but not excessive odorization is achieved with little labor making operation more satisfactory and more economical. No operator is required at the plant. Periodic maintenance checks are little more than inspections to make sure everything is still running smoothly.

Transcontinental has had satisfactory results with both cyclic sulfide and mercaptan odorants. With reduced leakage of odor, public relations problem is easily cleared up by ventilating station through activated carbon filters. No odorant is discharged to the atmosphere.

(Square root compensated pneumatic transmitter is product of Foxboro Co., Dept. CP, Foxboro, Mass. . . . or for more information check CP 4548 on handy form, pages 2 and 3.)

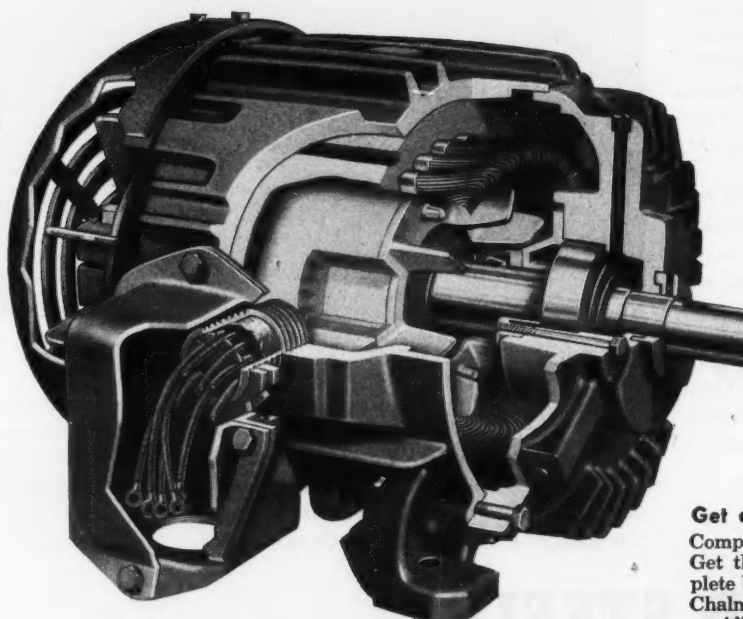
(Lapp Pulsafeeder is built by Lapp Insulator Co., Inc., Dept. CP, LeRoy, N. Y. . . . or for more information check CP 4548A, pages 2 and 3.)



It takes Six Bolts

-not just four

to give full bearing protection for greater motor performance



THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of extra protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.

Get all the facts . . . judge for yourself —
Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS



A-4540

When inquiring check CP 4549 on handy form, pgs. 2-3

CLAD STEEL WEIGH TANKS GUARD PLASTIC PROCESSING

Provision of economical, efficient, automatic weighing for chlorinated hydrocarbons presented a problem for this plastic processor. Discoloration and other contamination of the sensitive chemicals had to be avoided, and sub-zero temperatures were necessary to maintain their stability. So the company's engineers designed jacketed weigh tanks on suspended scales, allowing for circulation of coolant between the shells. Nickel-clad steel was specified as the *most economical* means of providing all the desired benefits in the inner shell.

The 20% layer of nickel cladding—permanently and integrally bonded to low-cost carbon steel backing plate—assures the corrosion resistance of solid alloy. There can be no discoloration of the sensitive plastic because of metallic pick-up, and smooth, inside clad surfaces are easily cleaned. Maintenance costs have been low since this equipment was placed in operation in 1947. Nickel-clad steel also gives the fast, uniform heat transfer so critical to the process. Rounded tops and all-welded construction provide strength; the ½"-thick clad steel walls do not warp or distort under pressure.

Whatever demands *your* processing places on tanks and pressure vessels, a wide range of clad steels will give you these benefits economically. You can profit by asking your fabricators' assistance *early* in your planning. Working with your engineers and consultants, a *qualified* equipment builder can help tailor clad steel tanks and vessels to your exact needs. They minimize first cost and assure long, trouble-free service life.

L

LUKENS CLAD STEELS

STAINLESS-CLAD • NICKEL-CLAD • INCONEL-CLAD • MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEELS AVAILABLE ANYWHERE

When inquiring check CP 4550 on handy form, pgs. 2-3



Corrosion-resistant nickel-clad steel in this battery of jacketed weigh tanks prevents contamination of vinyl plastics during processing.

Ask one of your fabricators to show you the new Lukens clad steel movie, "Equip for New Profits." Here—in full color and sound—are factual accounts of how clad steel equipment brings new economies. The story can suggest new ideas to everyone concerned with production efficiency. Or, contact Manager, Marketing Service, Lukens Steel Company, 750 Lukens Building, Coatesville, Pa.

IDEAS

Insoles last longer if alum-retanned

Cooperative tests conducted by Department of Agriculture have shown alum retanning imparts better wear to insole leather. Cooperating private tannery first tanned leather with vegetable extracts. Basic



aluminum acetate (an alum) was drummed into leather during fatliquor. In other tests insoles were dipped in a solution of the alum.

Shoes fitted with conventional insoles and alum-retanned insoles were then tested by Philadelphia postmen. After 9 to 12 months — after original soles and two resoles had been worn through — insole condition was checked. Results: 49% of conventionally tanned insoles and 85% of alum-retanned insoles were still usable. Postmen detected no discomfort with treated leather.

In specially developed lab tests (leather alternately moistened and dried while being flexed) tensile strength of alum-retanned leather ranked 81% better than conventional. And in every case, alum-treated leather showed better resistance to cracking.

(Courtesy U.S. Dept. of Agriculture, Agricultural Research Administration, Washington 25, D.C.)

Gears, cams, bobbins, easily cast by flexible mold method . . .

tolerances in plastisol mold kept within 0.005"

Intricate plastic parts can be cast at room temperatures from low-cost flexible molds made of vinyl-resin-base plastisols. Developed by Houghton Laboratories, Inc., Olean, N. Y., the method is simple, convenient, and economical for limited production runs and laboratory development work.

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Molds and castings are made in two steps with equipment found in most workshops or laboratories. Bakelite vinyl-resin-base plastisol is poured around part to be reproduced, forming an envelope $\frac{1}{4}$ -inch thick. This is cured at 350°F for about 15 to 20 minutes. After curing, original mold pattern is simply popped out of the flexible mold, leaving an accurate



Cast part is easily stripped from flexible mold

mold cavity. Bakelite C-8 epoxy resin (mixed with a hardener) is poured into cavity and allowed to set for several hours to eliminate air bubbles. Short after-bake at low temperatures hardens cast part. It is easily stripped from mold without use of release agent.

Mold tolerances are kept within plus or minus 0.005". Single mold will cast about five parts. One gallon of plastisol will make about 100 molds capable of casting average size gears, cams, or small machine parts.

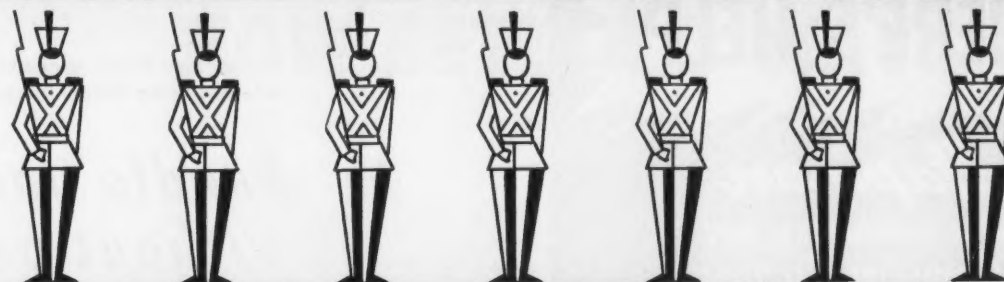
Severely undercut parts that usually call for costly split metal molds can be cast from a one-piece flexible mold. Method can also be used for embedding electronic assemblies in epoxy resins.

(Information courtesy Bakelite Company, a Division of Union Carbide and Carbon Corporation, Dept. CP, 260 Madison Avenue, New York 16, N. Y.)

Microprint reader described in full-color folder

Illustrated in full color, four-page folder describes device for reading microprint cards. Designed for use in offices and libraries, microprint reader has $8\frac{3}{4}$ " x $10\frac{1}{2}$ " screen, takes cards up to $8\frac{1}{2}$ " x 14", and enlarges 22 times.

"The Kodagraph Microprint Reader, Model A" is issued by Industrial Sales Division, Eastman Kodak Company, Dept. CP, 343 State Street, Rochester 4, N.Y. Specify CP 4551, pages 2 & 3.



UNIFORMITY

... Another Big Advantage of WELDCO *Welded* TUBING

When you order WELDCO Tubing, you're sure to get complete uniformity throughout—uniform wall thickness, uniform weight, uniform I.D. and O.D., uniform close grain structure, and uniform workability. These are some of the important advantages of welded tubing, and they guarantee you a dependable product . . . tubing that has excellent fabricating qualities . . . tubing that's easy to bend, form, weld and assemble.

Remember, too—only WELDCO Tubing is welded with the exclusive Double-Fusion Process. It's available in Stainless Steel, Monel, Hastelloy, Inconel, Nickel, and Cupro-Nickel, in tube and pipe sizes from 3" to 30", Schedules 5 and 10, and 3" to 12", Schedule 40. For special problems, or regular applications, always specify WELDCO—your best buy in top-quality, uniform tubing!

WELDCO

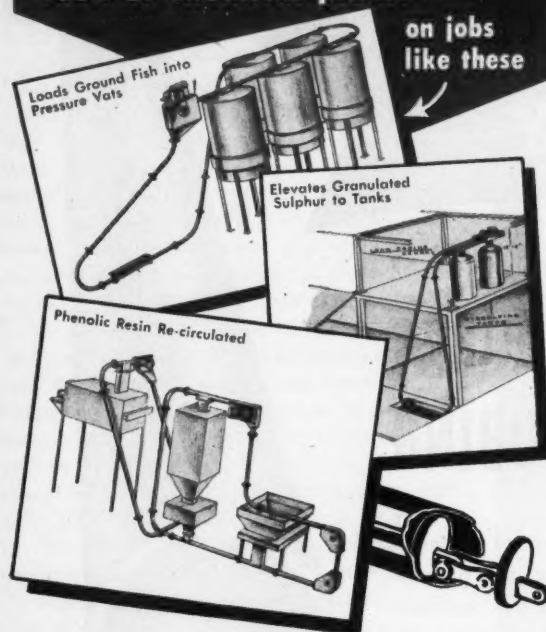
Whatever Your Needs
In Tubing . . .
You're 'Way Ahead
With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY
3763 OAKWOOD AVENUE YOUNGSTOWN 9, OHIO

When inquiring check CP 4552 on handy form, pgs. 2-3

HERE'S HELP!

let *Hapman*
tubular conveyors pay
for themselves in your
food or chemical plant!



on jobs
like these

CAN YOU CUT COSTS—for a better competitive position and longer profits? Yes—through automatic bulk materials handling with Hapman Tubular Flight Conveyors! Food and chemical processors often find labor savings alone pay for this equipment in one to three years!

ADDITIONAL BENEFITS resulting from Hapman's unique patented design features can be equally valuable. Hapman Tubular Conveyors are dust-tight, odor-tight, liquid-tight — *safely* confining wet or dry, corrosive or non-corrosive, toxic, hygroscopic or other materials. With one drive, circuits operate in any plane or angle, dodge obstacles, pass through walls or narrow spaces.

AS THE FIRST STEP toward safer, lower-cost handling, write us, describing your application and requirements. We'll help compute potential savings.

REQUEST BULLETIN CP-155
AND LIST OF FOODS OR
CHEMICALS NOW HANDLED.

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

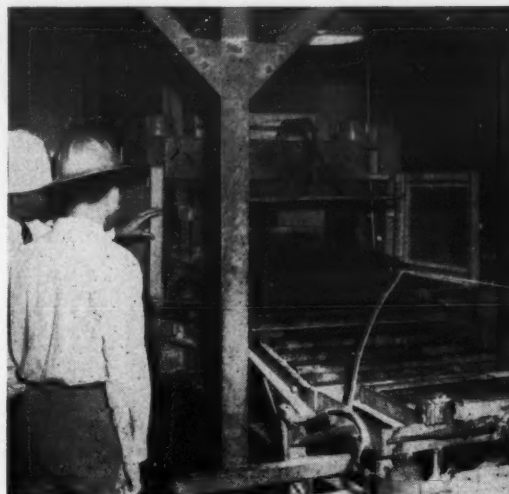
In British Commonwealth & Europe:
Fisher and Ludlow Ltd., Birmingham

In Canada:
Canadian Vickers Ltd., Montreal

material handling

Use of fork trucks and special warehousing methods
allows United States Rubber Co. to . . .

handle unitized loads without pallets



Bale of GR-S synthetic rubber is ejected from the baler cavity on to roller conveyor. From here bales are carried to packaging area and put into individual three-ply multi-wall bags which are closed on sewing machine conveyor

One laborer and one fork truck operator load up to 400,000 lb of GR-S rubber daily in boxcar loading operation

Problem: United States Rubber Company plant at Port Neches, Texas, normally produces and ships twelve million pounds of GR-S rubber per month.

Process begins with polymerizing of hydrocarbons to form a latex. This latex is then coagulated into particles of crude synthetic rubber. These are dried and pressed into bales measuring 14" x 7" x 28" and weighing about 75 lb. Each bale is packaged in a three-ply multiwall bag or, wrapped in 1½ mil polyethylene film, in a multi-unit corrugated paperboard container. Handling this large number of bales from presses to storage to loading docks quickly and without damage is a tricky problem.

Solution: Fork-lift trucks and a method of warehousing without the use of pallets makes handling



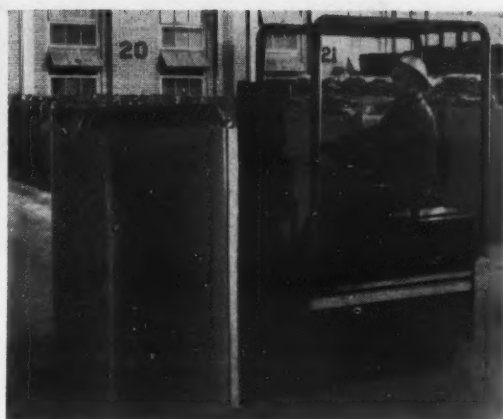
From sewing machine conveyor, bags are stacked into unit loads on this "L" shaped platform which assures all bags being in proper position and in line. Tapered, highly-polished chisel forks are inserted through channels on bottom of platform to pick up load

relatively simple. Fork trucks are of 2000 lb capacity and equipped with fully tapered four- or six-inch highly polished chisel forks which slide easily under bags even when on the floor. All fork trucks are electric to eliminate potential fire hazard, and have special rounded-corner batteries to allow maximum maneuverability.



Unit loads are stored on warehouse floor in long, even rows. Pyramiding of bags prevents tying, but this is not necessary because of ample space

When inquiring check CP 4553 on handy form, pgs. 2-3



Company recently began using this corrugated paper container which holds 32 bales. For this type of packaging each bale is wrapped in 1/2 mil polyethylene film. One man and fork truck can load 80,000 lb capacity boxcar in one hour

If bales are to be individually bagged, each bag is closed on sewing machine conveyor. From conveyor, bags are stacked into units on "L" shaped platform. Platform insures all bags being even and in correct position. There are 21 bags per unit. Channels on bottom of platform provide for insertion of truck forks. When unit has been made, fork-lift carries load to storage, setting each unit on floor. Tying is unnecessary because pallets aren't used, and because of ample storage space available in warehouses.

In passing from packaging area to warehouse, fork truck passes over Toledo scales which weigh the unit load, automatically compensate for fork truck, and print weight on ticket.

Results: Value of the unit-load system is especially obvious in boxcar loading operation. One fork truck operator and one laborer load up to 400,000 lb per day, with plant-wide average being 320,000 lb per day.

Formerly it required five laborers, plus fork truck operator, to load same tonnages if bags were palletized and had to be removed by hand for boxcar stacking. In addition to savings in manpower, loading of unpalletized bags is much faster.

US Rubber recently began using a corrugated paperboard container, developed with the Gaylord Container Corporation, which holds 32 bales, each wrapped in film. Like the bags, containers are unpalletized, being lifted off ground by tapered chisel forks. With these containers, package cost per bale is slightly less than with bags, and one fork truck operator can load an 80,000 lb capacity boxcar in one hour.

(Fork trucks and chisel attachments are products of the Clark Equipment Co., Dept. CP, 300 Second St., Buchanan, Mich. . . . check CP 4554, pgs. 2-3.)

Pace-Setting HD-5G Tractor Shovel NOW BETTER 3 WAYS

FOR EFFICIENT MATERIAL HANDLING



HD-5G TRACTOR SHOVEL

Rated capacity	1 1/4 cu yd
Belt horsepower	50
Weight, complete	16,200 lb
Dumping height	9 ft, 2 in.

From the time of its introduction seven years ago, the Allis-Chalmers HD-5G Tractor Shovel has been tops in popularity. Many thousands are daily proving their ability and versatility on all kinds of material handling and excavating jobs.

Now, design refinements make the HD-5G a three-way better value than ever before:

1. Has Bigger Rated Capacity

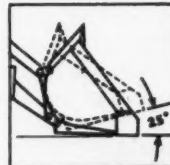
New bucket handles a big 1 1/4-yd load — streamlined design now helps roll in large loads with less tractor effort. The back of the bucket has been brought forward and the sides extended to cut spillage, put more payload where it's wanted.

2. Helps the Operator Do More

Cleaner dumping with the new bucket saves the operator time and effort shaking out loads.

For added versatility, there is a two-position bucket available with both standard automatic return to digging position and operator-controlled tip-back. If the operator chooses to use the controlled tip-back, he can load the bucket, then tip it back approximately 25° before raising, assuring maximum output under special conditions such as downhill loading or loading loose materials.

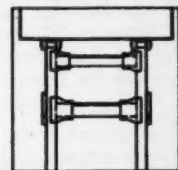
The HD-5G helps the operator do more in other ways, too — giving him full vision, fast and easy control, cleaner platform and more comfortable seat from



which to work, and more working time with truck wheels, support rollers and idlers that need greasing only once every 1,000 hours.

3. Works at Lower Cost

The HD-5G now works at even lower cost than ever before — not just because it *does more*, but because it has features that mean *less maintenance, longer life*. For instance, new type tubular bracing on the bucket booms provides added strength and support, keeps the bucket in line. The floor at the rear of the new bucket has been raised seven degrees to reduce wear on the bottom sheet. Heavy-duty truck wheels and idlers are available for particularly tough working conditions. One-piece, full-length main frame permits unit construction so that major assemblies can be removed without disturbing adjacent units, putting tractor back on the job in hours rather than days.



Ten Quick-Change Attachments Add to HD-5G Versatility

Bulldozer	Crane Hook	Tine Fork
Angledozer	Light Material Bucket	Rock Fork
Narrow Bucket	Trench Hoe	— also rear-mounted Ripper
Rock Bucket	Lift Fork	

See your Allis-Chalmers dealer for more about these and other production-boosting features of the popular HD-5G Tractor Shovel.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

When inquiring check CP 4555 on handy form, pgs. 2-3

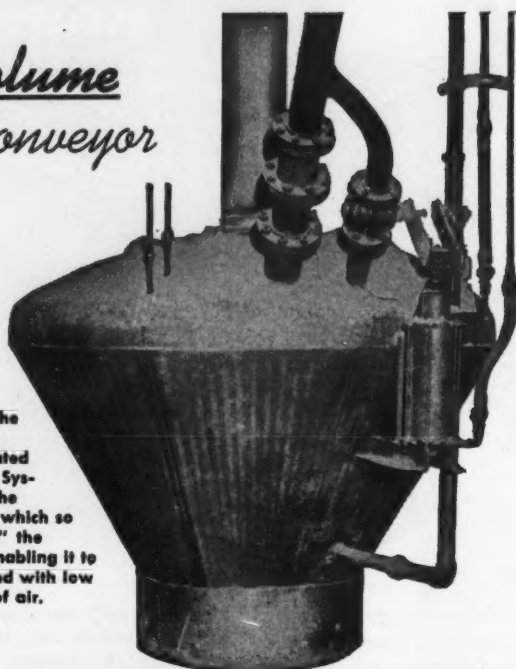
Robinson

Air Activated

Conveyor

The Low-volume Air Conveyor

Heart of the Robinson Air-Activated Conveyor System... the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.



Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON

Air Activated

A Division of
Morse Boulger Destructor Co.

CONVEYOR SYSTEMS

211-V EAST 42nd ST. • NEW YORK 17, N. Y.

Representatives in Principal Cities

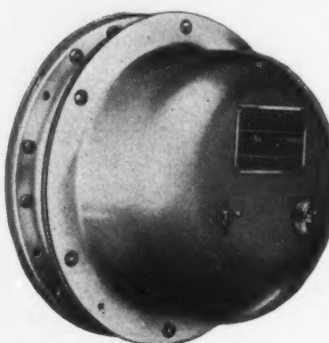
When inquiring check CP 4556 on handy form, pgs. 2-3

MATERIAL HANDLING

If bin needs refilling built-in light flashes on indicator

Uses: For installation requiring a level indicator signal which can be readily seen by an operator.

Features: Unit comes assembled and ready for connection to user's



Bin level indicator has built-in signal light

power source. There is only one terminal to connect.

Description: Bin level indicator has no springs or motors, switch mechanism being operated by flexible diaphragm.

Pressure of material in bin actuates diaphragm. Many diaphragm materials are available including cloth, rubber, neoprene, and Fiberglass.

Toggle switch permits signal light to be turned off when desired.

(Model AL is a product of the Bin-Dicator Co., Dept. CP, 13946-43 Kercheval, Detroit 15, Mich. ... or for more information check CP 4557, pages 2 and 3.)

Pictures and describes 7 1/2-ton lift truck

Illustrated 16-page brochure contains descriptive data and specifications on 15,000-lb capacity lift truck.

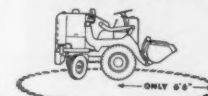
Form 1287B is issued by Hyster Co., Dept. CP, 2902 N. E. Clackamas St., Portland 8, Ore. When inquiring specify CP 4558, pages 2 and 3.

Lower tilt-back, lower carry

— loads without need for spinning wheels, travels faster



Bucket can tilt back to loosen tough materials or flip in small loads.



5' shorter turning radius (6'6"). Faster speeds to 13.88 mph in reverse, 7.66 forward.



Higher clearance (6'8"), more reach (2'7").

With the Auto-Scoop, operator can tilt the bucket back, independently of hoisting, at ground level. Can quickly loosen and load stubborn materials without undue crowding. Fast, low tilt-back also permits picking up small stockpiles, windrows. Carries low as 4 1/2" from ground, improves stability, speeds travel. Many other advantages. Write for Catalog L12-4.

JAEGER LOAD-PLUS auto-scoop
12 cu. ft.

1 cu. yd. Load-Plus available for bigger work.
The Jaeger Machine Company
616 Dublin Ave., Columbus 16, Ohio

When inquiring check CP 4559 on handy form, pgs. 2-3

Cut weighing costs by 12% with accurate, remote indicating SR-4 Crane Scale



A leading manufacturer of electrical equipment has reduced annual weighing costs by 12% with a Baldwin SR-4 Crane Scale. Why not investigate the wide variety of applications in which users of SR-4 devices obtain fast, accurate, economical measurement of load, fluid pressure or torque? Send today for our latest bulletins! Address Baldwin-Lima-Hamilton Corp., Philadelphia 42, Penna.



BALDWIN-LIMA-HAMILTON

Philadelphia 42, Pa. • Offices in Principal Cities
In Canada: Peacock Bros. Ltd., Montreal, Quebec

When inquiring check CP 4560 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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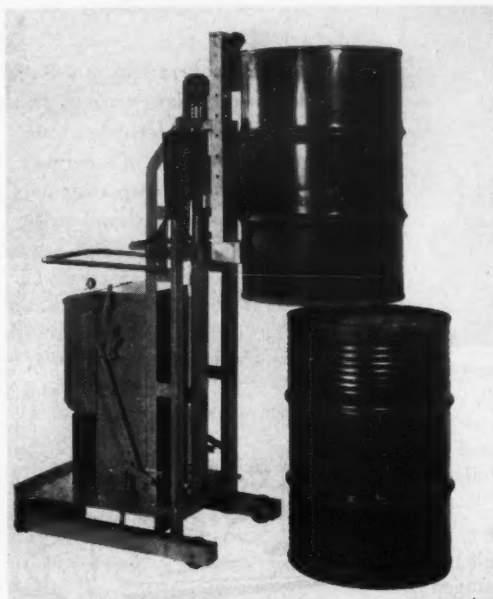
MATERIAL HANDLING

No blocks, skids or pallets needed for one-man handling of drums using portable stacker

Uses: For one-man operation in stacking drums without the use of blocks, skids or pallets.

Features: Stacker is equipped with anti-jar electronic cut-off switch and hydraulic flow-control valves as safety devices.

Description: Portable stacker is equipped with battery-powered hydraulic unit and has built-in



Eliminates manual labor in stacking drums

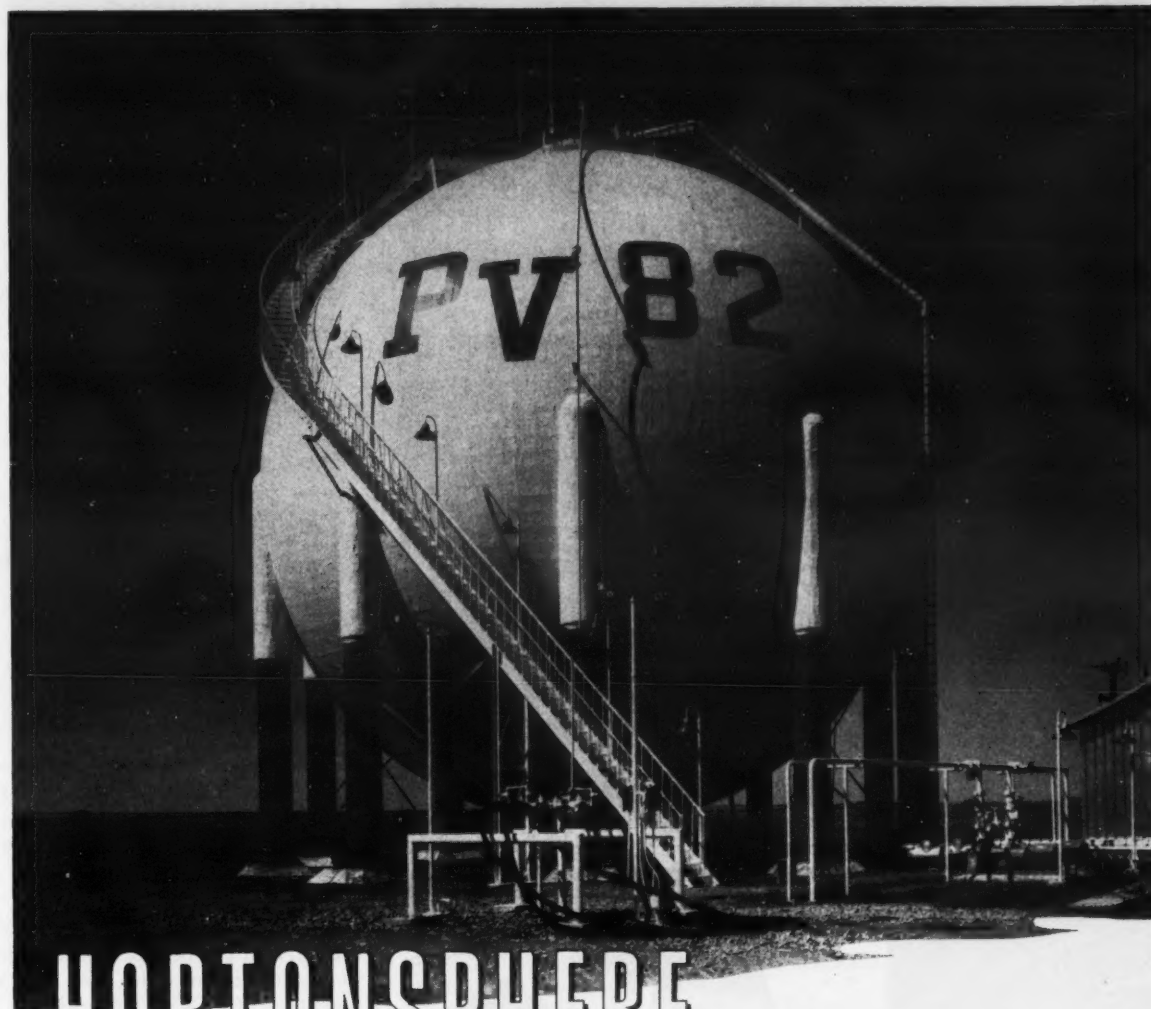
charger and automatic cut-off. There are two models: EL-55-2 for stacking drums two high, and EL-55-3 for stacking three high.

(Stacker is a product of the Safeway Industrial Equipment Corp., Dept. CP, 184 N. Franklin St., Chicago 6, Ill. . . . or for more information check CP 4561 on handy form, pages 2 and 3.)

Explains money-saving features of material handling system

Booklet of 32 pages, written in narrative style, gives complete explanation of principles and description of equipment used in manufacturer's material handling systems. Last section of brochure describes ways of individualizing jobs and organizing manufacturing processes.

"More Dollars . . ." brochure is issued by Alden Systems Co., Dept. 1, Dept. CP, Alden Research Center, Westboro, Mass. When inquiring specify CP 4562, pages 2 and 3.



HORTONSPHERE...with an Overcoat...

designed for 75 lbs. per sq. in. working pressure

stores anhydrous ammonia

- This 15,000-bbl. Hortonsphere®, insulated and refrigerated to help reduce pressure of stored anhydrous ammonia, is located at the Curry Chemical Company, Funk, Nebraska. It has been designed to withstand internal pressure and will not allow contents to escape as long as the setting of the pressure relief valves are not exceeded. Hortonspheres, for the storage of such liquids as anhydrous ammonia, butadiene, and other volatile liquids, are available in sizes to 30,000 bbls. Write our nearest office for complete information or quotations.



Chicago Bridge & Iron Company

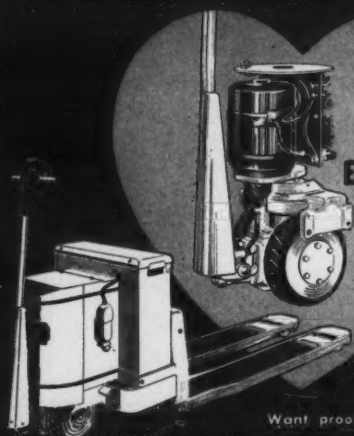
Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • New York
Philadelphia • Pittsburgh • Salt Lake City • San Francisco • Seattle • Tulsa • Washington
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

When inquiring check CP 4563 on handy form, pgs. 2-3

Heart of the Hydroelectric

THE DYNA-DUAL POWER UNIT

EXCLUSIVE



This sturdy Dyna-Dual Power Unit out performs all others for ease of operation—dependability—lowest maintenance cost and economy of power. Hydroelectrics will keep rolling and moving your materials at lower costs than any truck in its class.

Want proof? Complete facts and data on request.

Note: The Dyna-Dual Power Unit is interchangeable on all models.



LIFT TRUCKS
INCORPORATED

2423-31 SPRING GROVE AVE.
CINCINNATI 14, OHIO



There is a model for every purpose to handle any kind of material.

When inquiring check CP 4564 on handy form, pgs. 2-3

Investigate How Loading Dock Shelters Can Save Money For You

TRUCKS

SEND FOR YOUR FREE GUIDE
TO IMPORTANT FACTS ABOUT
LOADING DOCK SHELTERS

BOX CARS

Your
GUIDE

to...
**IMPORTANT FACTS ABOUT
LOADING DOCK
SHELTERS**

Representatives In Principal Cities

See How ATLAS
Loading Dock Shel-
ters Give You Pro-
duction-Line Econ-
omies With "Cus-
tom Engineering"
To Fit YOUR Needs

Atlas Industries, Inc.

1304 W. Washington Blvd. Chicago 7, Illinois

Send me your FREE Guide To Important Facts About Load-
ing Dock Shelters.

Name _____

Address _____

Firm _____

City, State _____

When inquiring check CP 4565 on handy form, pgs. 2-3

MATERIAL HANDLING

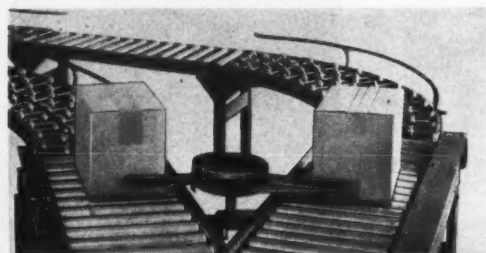
Prevents converging jam-up of packages on parallel conveyor lines . . .

feeds commodities from two conveyor lines
into one without interference

Uses: Device is used at converging point of
conveyor lines to prevent jamming of packages.

Features: Unit will not lock if two boxes con-
tact the arms at the same time. Design is such that
one commodity will take preference.

Description: Non-interference device can be
changed in the field for use on parallel conveyor



Feeds one package at a time at converging conveyor
point and prevents pile up of packages

lines, various angle converging units, and even
right angle transfers, using belts, live rollers, or
gravity conveyors.

Unit requires space 10" in diameter and is about
4" high. It can be raised or lowered to suit height
of various commodities. Arm length is changed by
addition of a "flat" on arms provided. This will
allow for converging long and short boxes in
same conveyor line.

(E-Z Merger is a product of the Standard Con-
veyor Co., Dept. CP, 330 2nd St., N.W., North
St. Paul 9, Minn. . . or for more information
reader may simply check CP 4565A on the con-
venient Reader Service slip which is located be-
tween pages two and three.)

One-man handling of heavy loads made easier with portable floor crane . . .

unit is equipped with release valve which
will automatically stop overloading

Uses: For lifting operations such as unloading
freight, moving machinery, etc.

Features: Castered wheels make unit highly
portable.

Description: Hydraulic floor crane can handle
loads up to 1/2 ton. Overall height is 72" and

The case of the grounded ice cubes . . .



The operations of a Buffalo
ice-making plant came to a costly
impasse. Ice cubes were
grounded for want of some way to
unclog their transporting devices.
Hammering was slow and often
damaging to the equipment.

There was a solution,
however, that solved the problem
economically and swiftly . . . a
CLEVELAND vibrator.



Let us know about your grounded
material, or ask for our detailed
literature. Engineering
recommendations without cost
or obligation.

AIR and ELECTRIC

Bin Stuck Lately?



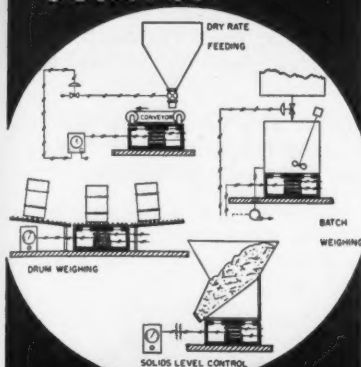
THE
**CLEVELAND
VIBRATOR**
COMPANY

2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 4566
on handy form, pgs. 2-3

CHEMICAL PROCESSING

a **NEW** tool for process control



W/C Weighing Scale PNEUMATIC-PLATFORM TYPE

- For batch or continuous weighing of solids or liquids
- For remote indication or continuous flow control
- With accuracy above 0.25% of range
- Highly sensitive, extremely rugged
- No springs, knife edges, or levers
- Unaffected by off-center loading on platform
- Unaffected by vibration

Here's the latest step toward continuous process control of your plant—especially in explosive or dusty atmospheres. It's the new W/C Weighing Scale . . . fully tested, proved, and guaranteed to cut processing time or improve your yield.

Based on the force-balance principle, the W/C Weighing Scale translates weight into a pneumatic output signal. It is furnished complete with a remote panel containing a weight indicating scale 45 inches long.

Available in ranges up to 5000 pounds, it is the first device that reliably uses weight as a criterion of measurement to meet the demands of modern process control.

WRITE FOR Catalog which gives complete details, engineering drawings, and calibration curves.



WEIGHING COMPONENTS, INC.

64-B Fulmor Ave. • Hatboro, Pa.

When inquiring check CP 4567 on handy form, pgs. 2-3

MATERIAL HANDLING



For lifting loads up to 1/2 ton

overall width is 35". Beam travel is 47". Beam's highest position is 92" and the lowest is 45". Weight of unit is 186 lb.

(Hydro-Crane is a product of the Stratton Equipment Co., Dept. CP, 2030 East 105 St., Cleveland 6, Ohio. . . or for more information check CP 4568 on convenient Reader Service slip located between pages 2 and 3.)

Shows where to look for answer to material handling problems

Material handling equipment directory is valuable guide for anyone with packaging, material handling or shipping responsibilities as well as engineers concerned with movement of materials in processing.

Divided into six sections, 644-page directory covers equipment and manufacturers, trade names, manufacturer's outlets, and engineering and technical data, and shows where equipment can be rented or purchased. Illustrations show various types of equipment and attempt to standardize definitions.

Technical data section has 115 pages of tables, charts, graphs, nomographs, formulas, shipping, packaging and warehousing information. It also has section on box-car loading.

Book has hard bound cover and is index-tabbed.

1954-1955 Flow Material Handling Equip. Directory is available by remitting \$6.50 direct to Industrial Book Co., Dept. CP, 1240 Ontario St., Cleveland 13, Ohio. When inquiring specify CP 4569 on handy form located between pages 2 and 3.



The Right Start for Your New Product: Gaylord Boxes for Safe Shipment

It's an exciting moment in any factory—that moment when the new product is ready for launching.

So good to know at this time that the product is starting out right in containers which guard against damage down the line. Developed with the same care as you give your product, Gaylord Boxes combine proved design with quality board to give you superior protection.

You owe it to yourself—and to your products, new or old—to investigate Gaylord Boxes. Call your nearby sales office.

Gaylord Container Corporation

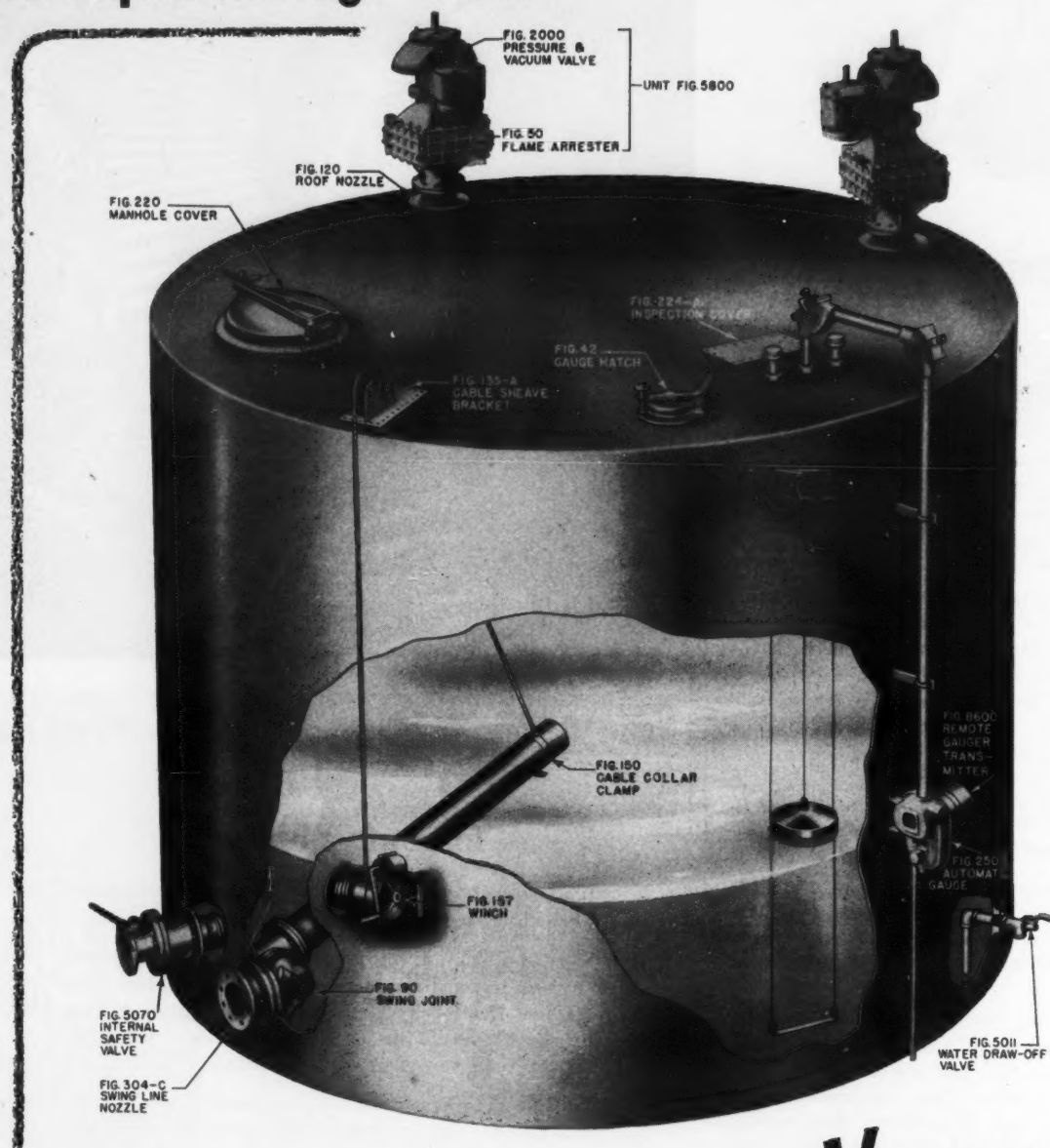
GENERAL OFFICES
SAINT LOUIS, MO.



SALES OFFICES
COAST-TO-COAST

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

You can depend on **"Varec"** Equipment for Liquid Storage Tanks



For over a quarter of a century, "Varec" has been manufacturing quality tank equipment. Its reliability and satisfaction are attested by thousands of installations located all over the world. Your request for detailed information will bring our prompt reply.

"Varec"

VAPOR RECOVERY SYSTEMS COMPANY
2820 No. Alameda St., Compton, Calif.
CABLE ADDRESS
Varec Compton, Calif. (U.S.A.) All Codes

When inquiring check CP 4570 on handy form, pgs. 2-3

MATERIAL HANDLING

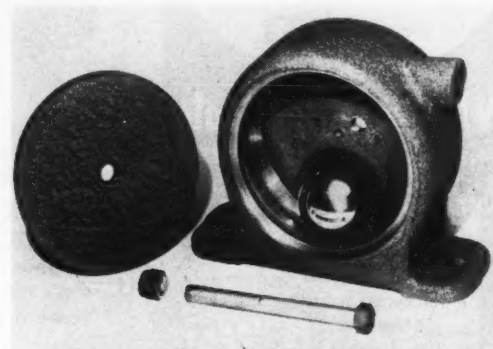
Shakes stubborn material loose from chutes and bins . . .

uses air and steel ball to break down bulk material hang up

Uses: For breaking up arching and jamming in bins, hoppers, chutes, feeders, and other places where bulk materials hang up. It can also be used for vibrating tables or platforms, sorting, and other applications.

Features: Unit has only one moving part. It performs at high or low temperatures and does not require lubrication or periodic maintenance.

Description: Only moving part is a steel ball. Air jet blows it at high speed around steel track in housing. Weight of ball develops strong centrif-



Air drives steel ball around housing to shake material loose from bins

ugal force, which vibrator transmits through its mounting into object to be vibrated. Compressed air enters through small tangential jet which increases air velocity. It exhausts through one side with special provision for deadening exhaust noise. No special line oilers or air filters are necessary. Air hose large enough to deliver specified quantity of air is all that is needed.

(AiroViber is a product of the Viber Co., Dept. CP, 726 South Flower St., Burbank, Calif. . . or for more information check CP 4571 on handy form, pages 2 and 3.)

Brochure describes system for continuous blending

Illustrated technical reference pictures and describes high-ratio continuous blending system. Featured in the technical reference is description of a process coating prills with clay. Tech Ref 54D is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. When inquiring specify CP 4572, pages 2 and 3.

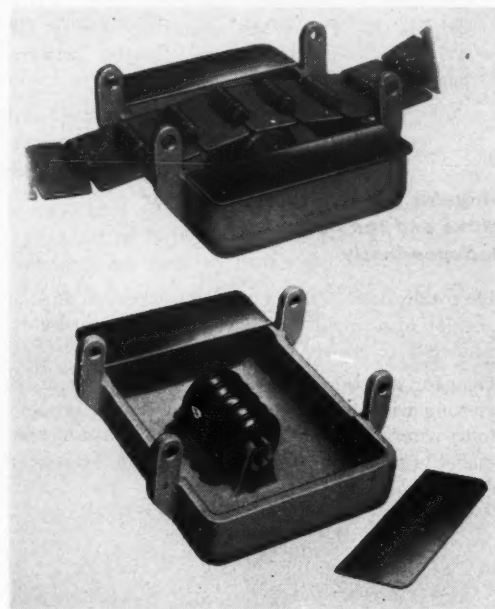
Bottle conveyors kept cleaner using lubricant dispenser . . .

lubricator operates only when conveyor is moving

Uses: For lubricating chain bottle conveyors.

Features: Lubricant, whether liquid or semi-solid, can be added while conveyor is operating. One fill is usually sufficient for day's operation. Maintenance is negligible since there is no spigot to become clogged.

Description: Unit is designed for mounting under return conveyor chain. Chain is lubricated as it passes over the O-ring-equipped roll, which is immersed in lubricant pan. Lubricator for single



Provides smoother conveyor operation

(4 1/2" wide) track will hold from one to five rings; unit for double (8 5/8" wide) track holds twice as many. Rate of application is varied by simply adding or removing O-rings.

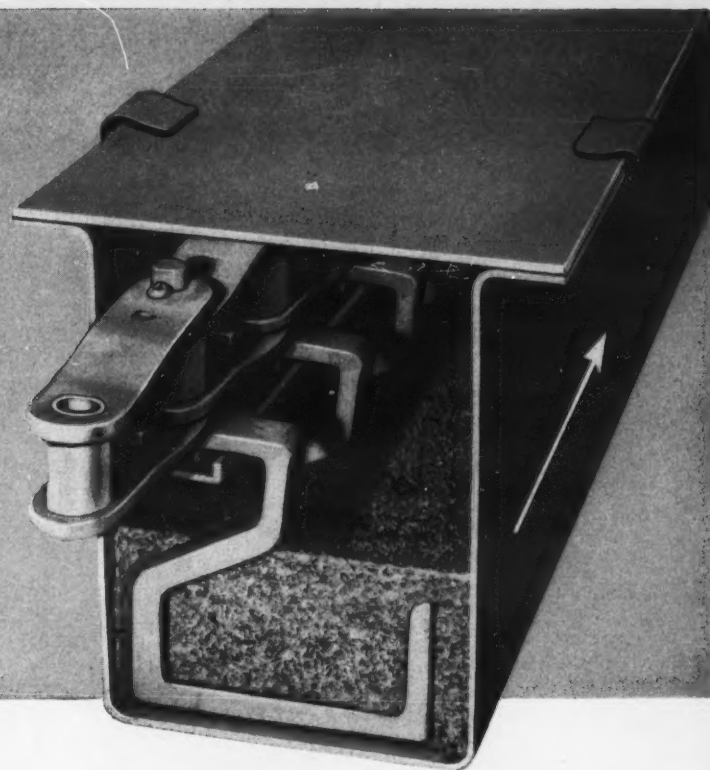
(Lubricant dispenser is manufactured by Cherry-Burrell Corp., Dept. CP, 427 W. Randolph St., Chicago 6, Ill. Check CP 4573, pages 2 and 3.)

Does your plant need modern material handling methods . . . ?

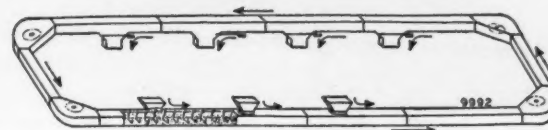
check the handy Product Directory (pages 170 to 173) for a quick reference to ideas and equipment in this issue.

CONVEYS ANYTHING Economically from COAL to CORNSTARCH

with simultaneous pick-up or discharge at one or many points . . . without dust or contamination . . . in small space



This is an S-A REDLER Horizontal Closed Circuit Conveyor — and a very remarkable unit it is!



It conveys in four directions — can pick up and discharge at many points on its run simultaneously or selectively—does the work of several conveyors of other types. It is fully enclosed — dust-tight and contamination-proof. Because it moves materials *in mass*, in a solid column, it minimizes dust formation and degradation and practically eliminates explosion hazards.

It is self-feeding and can be choke fed without jamming. Any excess material simply recirculates until needed. The REDLER is also self-cleaning, an important advantage when the operation calls for running

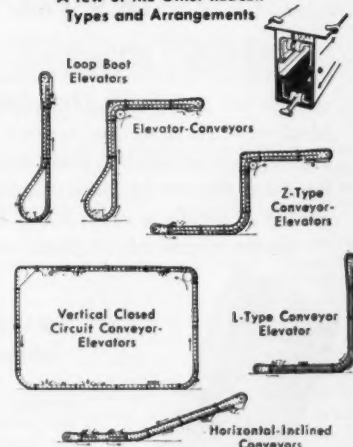
various materials in sequence. It makes an ideal blending conveyor.

Unusually compact, REDLERS require a minimum of structural support. They can be easily and economically adapted to practically any plant layout.

The closed circuit REDLER is just one of many types furnished by S-A. If you handle or work with any kind of granular, pulverized, flaky or small lump material, a REDLER can help you do it better, cleaner and at lower cost.

Write for Catalog No. 140. We'll be glad to give you a preliminary cost estimate. No obligation, of course.

A few of the Other REDLER Types and Arrangements



STEPHENS-ADAMSON MFG. CO.

11 Ridgeway Avenue, Aurora, Illinois • Los Angeles, Calif. • Belleville, Ontario

Engineering Division

Specialists in the design and manufacture of all types of bulk materials conveying systems.

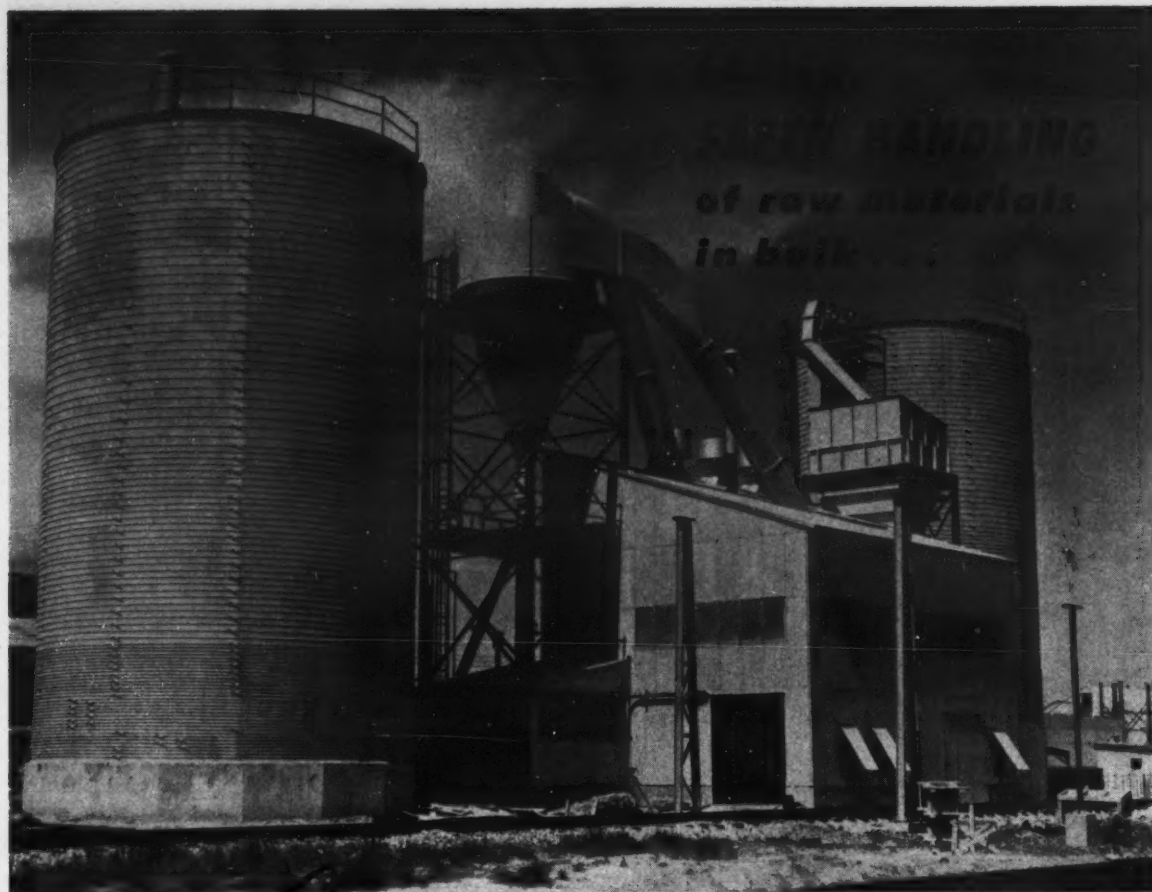
Standard Products Division

A complete line of conveyor accessories including centrifugal loaders—car pullers—bin level controls—etc.

Sealmaster Division

A complete line of industrial ball bearing units available in both standard and special housing

When inquiring check CP 4574 on handy form, pgs. 2-3



Efficient handling of bulk materials is provided by this Marietta designed and erected storage system at Texas City Chemical Co., Texas City, Texas.

Marietta

GREATEST NAME IN SILOS

Stockpiling of raw materials is essential, but storing materials in outmoded or limited-capacity storage systems is a sure, quick path to raising handling costs. Modern Marietta storage systems are versatile. They are designed to help you make more profit by providing more efficient methods of handling materials . . . readily adaptable to every industrial storage need.

Single or multiple Marietta concrete storage silos

are in use today by many industries for storage of widely varied materials. Marietta precast solid or Air-Cell concrete stave construction is sturdy . . . durable . . . stressed to carry heavy top or side-mounted machinery of any type needed for your operations. Built to stay "bone dry," they eliminate waste and spoilage . . . keep even the most hygroscopic materials in usable condition.

MARIETTA AIR-CELL lightweight aggregate STAVES

Stronger . . . thicker than standard staves . . . an exclusive Marietta development. Give greater protection especially when dry materials are stored.

Marietta precast Air-Cell staves, made from lightweight aggregate, are 3 1/4" thick and provide insulation value equal to 15" of solid concrete.

THE

Marietta

CONCRETE CORPORATION
MARIETTA, OHIO

BRANCH
OFFICES:

- 501 FIFTH AVE., NEW YORK 17, N. Y.
- PULASKI HWY. AT RACE RD., BALTIMORE 21, MD.
- BOX 5192, CHARLOTTE 6, N. C.
- 411 FOSTER ST., NASHVILLE, TENN.
- HOLLYWOOD, FLA. • JAMESTOWN, N. Y.

Representatives in Principal Cities

PRECAST CONCRETE PRODUCTS FOR FARM, HOME AND INDUSTRY

When inquiring check CP 4575 on handy form, pgs. 2-3

MATERIAL HANDLING

Work kits handy for applying lift truck performance data

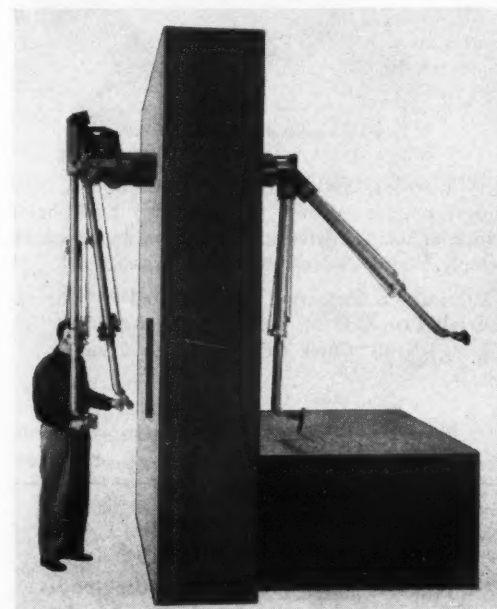
Work kits provide method for predetermining time necessary for fork lift trucks to perform specific operations. Included in each kit are a quantity of work sheets which can be used in evaluation of standard performance times for specific fork truck operations. Manufacturer and University of Pennsylvania spent more than two years to complete initial phase of study based on performance of 4000-lb electric fork lift truck. Data developed from study has been divided into two major sections — basic time values and variable factors.

Work kits are issued by Yale & Towne Mfg. Co., Dept. CP, 11000 Roosevelt Blvd., Philadelphia 15, Pa. When inquiring specify CP 4576 on convenient form, located between pages 2 and 3.

Angular position of manipulator slave end can be varied independently

Electrically-driven canting mechanism permits angular position of manipulator's slave end to be varied independently of master end.

Operator can bring specimen under analysis up to viewing window without backing away, as is sometimes necessary. In addition, canting mechanism automatically raises slave end to horizontal so that manip-



Lets operator view specimen without having to back away from viewing window

CHEMICAL PROCESSING

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MATERIAL HANDLING

ulator arm may be removed easily from barrier wall for repairs or repositioning in another cell. Light overhead crane can be used by one man to slide arm from wall and into new location in less than 5 min.

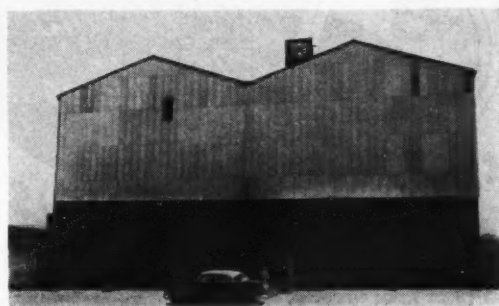
Manipulator can handle loads of 10-15 lb in any operation while loads of 60 lb can be handled in straight lift with auxiliary hook. Each arm of unit weighs about 230 lb and is mounted through a single 8" diameter opening in wall at height of 10 ft.

Design does not impose any restriction on wall thickness. Useful working area for pair of arms inside cell is approximately 3' deep and 8' wide at height of 40" from floor.

(Model 8 Master-Slave Manipulator is manufactured by Central Research Lab., Inc., Dept. CP, Red Wing, Minn. . . or check CP 4577, pages 2 and 3.)

Steel warehouse for bulk material set on 25 foot high concrete walls

Storage and operational building at South Point, Ohio plant of Nitrogen Div. of Allied Chemical & Dye Corp. has some unusual structural features. A 14,400 sq ft standardized steel building is set on 25 ft high buttress walls of reinforced concrete. Normally, such steel-framed buildings are erected on ground level foundations. Principal reason for high concrete walls here is to withstand stress of huge sloping

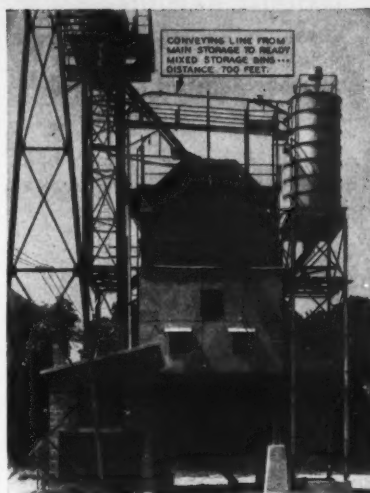


Standardized steel building has 25 ft high concrete base to withstand stress of bulk material piles

pile of bulk materials stored in warehouse.

Steel-framed portion of 120 ft long structure is 23 ft high to the eaves and has two 60 ft clear-span bays, thus providing maximum unobstructed area for storage. Frame is covered with corrugated industrial aluminum. Warehouse will be equipped with overhead craneway for operation of 5-ton bucket crane, above which will be special conveyor system and walkways.

(Information courtesy of Luria Engineering Co., Dept. CP, 500 Fifth Ave., New York 36, N.Y. . . or check CP 4578 on handy form, pages 2 and 3.)

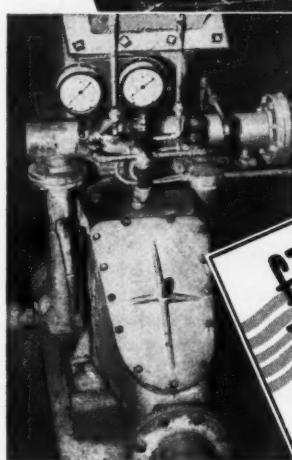


Main cement-storage bins, conveying line from Fuller-Kinyon Pump in pit underneath tracks.

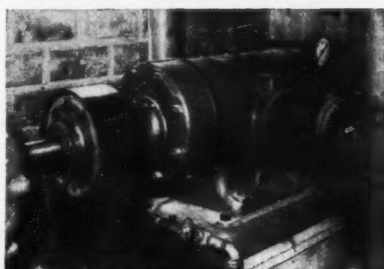
Ready-mixed concrete plant. Cement storage bins and truck loading station.



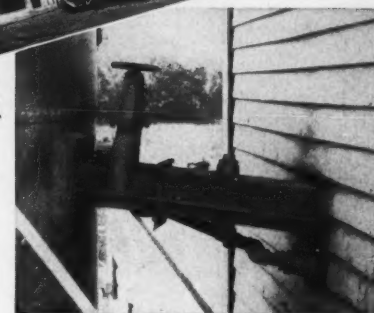
Overall view of plant. Main cement-storage bins, car-unloading station, and block plant, right. Ready-mixed plant, extreme left. Approximate conveying distance from unloading station to ready-mixed plant, 700 feet. Conveying pipe line partially underground.



Fuller-Kinyon Pump in pit underneath tracks. Delivers cement to either main storage bins or to ready-mixed plant.



Fuller Rotary Single-stage Compressor which furnishes air for the Fuller-Kinyon System. Capacity 526 c.f.m., 28-lb. pressure.



F-H Airslide for delivery of cement from storage bin to weigh scale over mixer in plant.

**flow
your
cement**

like Central Builders does with Fuller-Kinyon System and F-H Airslides

Central Builders Supply Co., Sunbury, Pa., operating both block and ready-mixed plants at one location, represents one of the most efficient plant layouts in the East, due to its centralization of bulk-cement handling. This was made possible through the use of the Fuller-Kinyon Conveying System and F-H Airslides . . . safe, clean, economical distribution of cement used in the manufacture of its products.

Incoming cement, received in hopper-bottom cement cars, is delivered to a Fuller-Kinyon Stationary Pump located in a pit underneath the railroad tracks. From this point cement is elevated vertically, through dust-tight pipe lines, to two main storage bins, or by the use of a two-way valve in the conveying line, direct to the ready-mixed plant, a distance of approximately 700 feet. Cement can also be reclaimed from these storage bins and conveyed, by the same Pump, to the ready-mixed plant.

Reclaiming from the large bin is accomplished by using two individual Airslides. One Airslide conveys from an overflow cone, installed in the top section of the bin, to a weigh batcher in the block plant. The second Airslide, located in the bottom of the bin, delivers to the Pump, for conveying to the ready-mixed plant. Cement is spouted by gravity from the smaller bin to the Pump.

Fuller-Kinyon Systems and F-H Airslides have many advantages for the conveying of dry, pulverized materials. If you handle such materials it will be worth your while to learn about Fuller air-conveying systems. Write us today!

FULLER COMPANY—CATASAUQUA, PA.

Branch offices

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

G-88
2244

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS • • • COMPRESSORS AND VACUUM PUMPS • • • FEEDERS AND ASSOCIATED EQUIPMENT

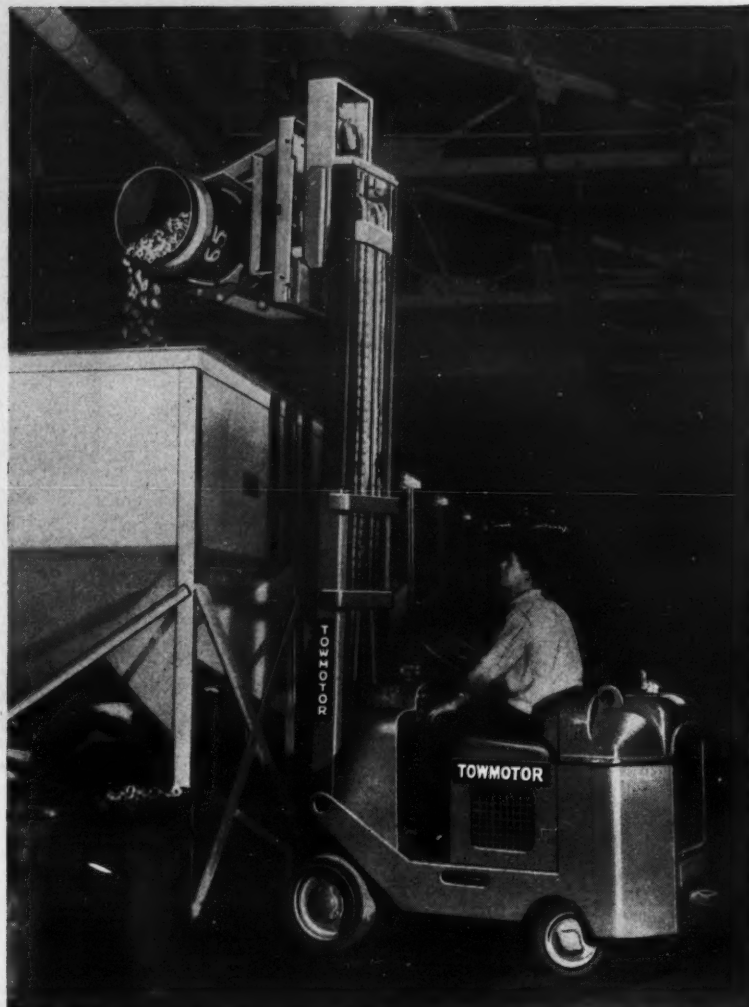
When inquiring check CP 4579 on handy form, pgs. 2-3

TOWMOTOR

THE ONE-MAN GANG

FORK LIFT TRUCKS

at Columbia Malleable Castings Corporation



300% PRODUCTION INCREASE

... Overall Handling Costs Cut 60%

Job-Planned Towmotors now pour finished parts into hoppers using a Revolving Barrel Grab. Parts feed down to a weighing conveyor and are bagged mechanically for shipment. Manual filling was eliminated and output per man increased 300%. Overall, Towmotor cut handling costs 60%.

Towmotor equipment does wonders in every plant where handling is a problem. For more information write for Job Studies covering your industry, your competition. TOWMOTOR CORPORATION, Div. 2301, 1226 East 152nd Street, Cleveland 10, Ohio.

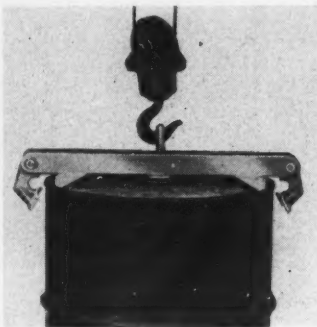
FOR FAST ACTION—See a Material Handling Specialist—your nearby Towmotor Representative. His factory training will show you the quickest way to attain maximum handling efficiency at minimum cost.

When inquiring check CP 4581 on handy form, pgs. 2-3

MATERIAL HANDLING

Provides vertical handling of open or closed drums

Vertical drum lifter handles open and closed steel drums in vertical



Lifts open or closed drums

position, by crane or hoist. Construction is all-steel welding.

(Lifter is a product of the Palmer-Shile Co., Dept. CP, 16016 Fullerton, Detroit 27, Mich. . . . or for more information check CP 4582 on handy form, pages 2 and 3.)

Covers workers and goods on loading dock

Rolling on wheels, portable loading dock shelter snakes out from shipping room door across open docks. When not in use it folds compactly back around door.

Unit can be used to connect adjoining plants as well as for covering open spaces on docks.

(X-Tra-Span is a product of Atlas Industries, Dept. CP, 1300 Washington Blvd., Chicago 7, Ill. . . . check CP 4583, pages 2 & 3.)

Shows complete line of overhead cranes

Single, double, and box girder cranes are shown at work in eight-page folder.

Bul 154 is issued by Michigan Crane & Conveyor Corp., Dept. CP, 115 N. McKinstry Ave., Detroit 9, Mich. Specify CP 4583A, pages 2 and 3.

NEW Weld-Bilt

automatic

CONVEYOR-LIFT ELEVATORS

speed your production flow!

One of three Weld-Bilt elevators in the automatic plant of a leading Television Manufacturer



Weld-Bilt Products Include:



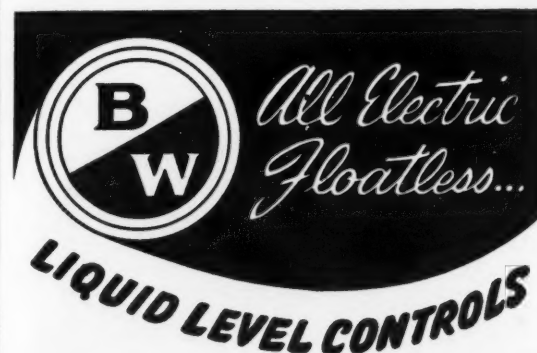
Here's a great time and man-saver where production flow demands multiple-level conveyor systems. . . . It's a new Weld-Bilt development in AUTOMATIC Conveyor-Lift Elevators. Lifts or lowers packages or parts from one level to another, automatically selecting and lifting certain packages, passing others, if desired. Power rollers on lifting platform move load off in any required direction. All this is done without manual attention, to keep your production moving swiftly, without interruption.

The Weld-Bilt Automatic Conveyor-Lift can be built to any designed capacity, any height, with controls to handle any situation or need. Write today for details — or the services of a Weld-Bilt materials handling engineer. You'll save money, time, labor. Let us prove it!

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS

322 WATER STREET, WEST BEND, WISCONSIN

When inquiring check CP 4584 on handy form, pgs. 2-3



Control variations in levels from 1/4" upward. Remote control if desired — any distance. Controls unaffected by acids, caustics, pressures or temperatures.

Since 1933 B/W Controls have provided positive, dependable, economical liquid level control. No floats! No vacuum tubes! No moving parts in liquid.

WRITE FOR CATALOG
B/W CONTROLLER CORPORATION

Birmingham, Michigan
2204 E. Maple Road

FIRST and FOREMOST
IN THE FLOATLESS
CONTROL FIELD

When inquiring check CP 4585 on handy form, pgs. 2-3

CHEMICAL PROCESSING

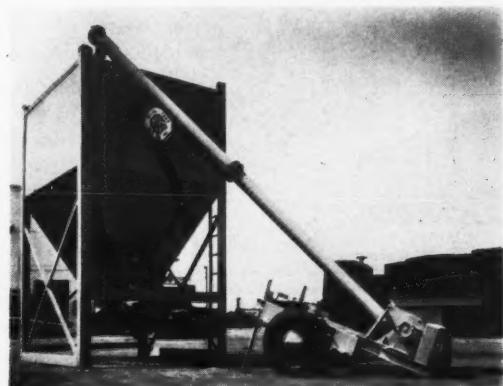
Mobile, two-screw conveyor unit has 60-ton hourly capacity moving granular material . . .

hydraulically-controlled elevating screw adjustable to heights from six to sixteen feet

Uses: For conveying granular products.

Features: Two-wheel conveyor can be moved into field position behind an auto or light truck and placed in service immediately.

Description: Powered by two-cylinder engine equipped with self-starter and clutch and gear-re-



Hydraulically-controlled screw conveyor is mobile. It uses two-cylinder engine to move material to 16'

duction unit, conveyor is capable of handling up to 60 tons of material per hour.

Conveyor's short cross screw serves as feeding unit for longer elevating screw. Design allows feeding hopper to remain level with ground at all times, regardless of elevating screw's delivery angle.

(Ba-zooka Conveyor is a product of the Delta Tank Mfg. Co., Dept. CP, Choctau Drive, Baton Rouge, La. . . . check CP 4586, pages 2 and 3.)

Pictures and gives specifications on rubber containers

Illustrated spiral-bound booklets give complete specifications on 70 cu ft and 300 cu ft collapsible rubber containers for handling, shipping and storing of bulk materials. Publications contain photos of containers in use. Information on 70 cu ft models is contained in Bulletin CP-70 and Bulletin CP-300 for 300 cu ft models.

Bulletins on collapsible rubber containers are issued by The Container Products Div., U. S. Rubber Co., Dept. CP, 1230 Avenue of the Americas, New York 20, N.Y. When inquiring specify CP 4587 on handy form, pages 2 & 3.)

FLEXMOUNT Oscillating Conveyors

. . . so simple they can be installed from stock

And so effective they've cut conveying costs of many hard-to-handle materials to a new low

HERE'S a conveyor with so many exclusive advantages that it's whipped some handling problems that were previously real bottlenecks. What's more, FLEXMOUNT Oscillating Conveyors are *pre-engineered*—can be bought right "off-the-shelf" and installed with no delay for special engineering.

Stock sections in 8, 12 and 18 in. trough widths make up into any desired length. Congested locations offer no problem—FLEXMOUNT requires an opening only slightly larger than the size of the trough.

As for flexibility, these remarkable conveyors are in a class by themselves. High-sided, all-metal, leakproof trough can be fitted with dividers to handle two or more materials simultaneously without mixing. They can be steam or water-jacketed, made dust or gas-tight. Also easily adapted for screening and scalping.

Get complete information on FLEXMOUNT Oscillating Conveyors from your nearby Link-Belt office or distributor.

How Positive Action moves material



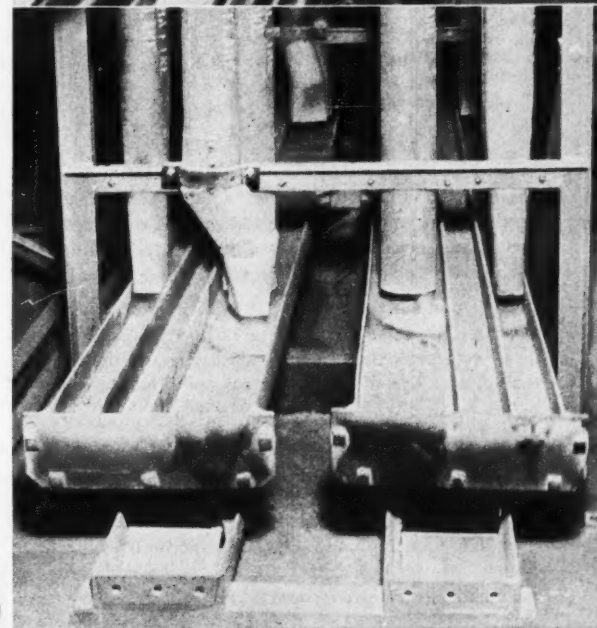
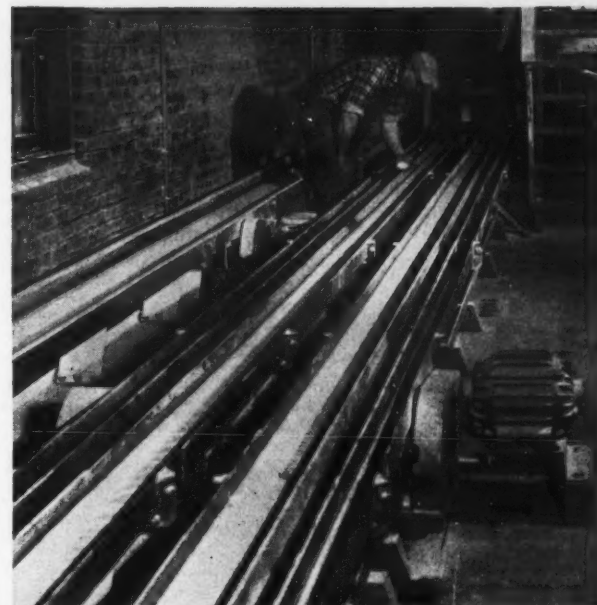
Positive-action, constant-stroke eccentric drive provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum.

LINK-BELT

FLEXMOUNT OSCILLATING CONVEYORS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

When inquiring check CP 4588 on handy form, pgs. 2-3



These three Link-Belt FLEXMOUNT Oscillating Conveyors are installed at a Michigan salt refinery. Each of the two partitioned units handles three grades of salt.

13,444

In one of the first large-scale applications of electronic control to a process, Rock Island Refinery finds speed of response secondary to other advantages when . . .

electronics control UOP platforming unit

ART ALDOUS, Instrument Foreman,
Rock Island Refinery, Indianapolis
with BRUCE FADER, Associate Editor

Despite the fact that electronic control systems are nearly always touted as the fastest method of control, speed does not top the list of advantages at Rock Island's Platformer control installation.

In operation since early July, 1954, electronic control was easy to install (no tubing racks). It maintains better control because of high sensitivity and the fact that greater use of derivative control can be made.

Speed, though, is not lacking in this control system. Although transmission lags are negligible with electronic signals, there remain lags in "filling up" pneumatic valve operators. High capacity air relays which respond to electrical signals, however, have pared these lags to a minimum. Overall response of control system is probably better than a comparable all-pneumatic instrument system.

One point left to prove — but not really in doubt — is cold weather performance. There can be no freeze-ups in electric wiring. Electric-to-pneumatic relays were built to incorporate electric heaters. This prevents freezing.

Behind better control at Rock Island is a difference in operating principle. Unlike conventional controllers, these electronic instruments convert electrical

signals to control functions without *mechanical* balancing. This prevents instruments suddenly catching up to changes that have been taking place at very low rates. Electronic instruments remain "aware" of low rate changes and correct as they go. As a result, derivative rates never before practical are now being used.

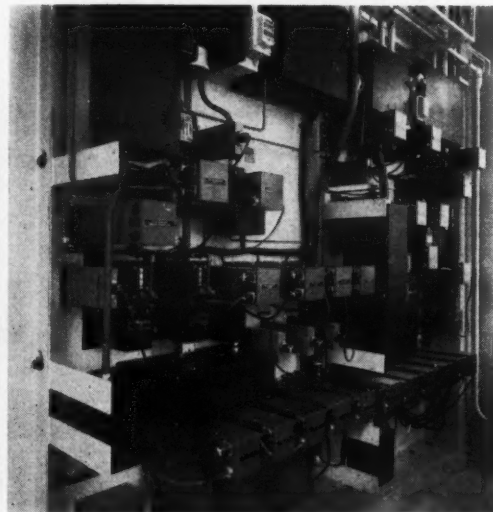
Wartime Radar and electronic gear proved that elec-

tronic instruments need not be delicate. Similarly, maintenance of instruments at Rock Island is already settling down to a routine affair. "Special Red" industrial vacuum tubes are used in controller (guaranteed life 10,000 hours). Recorders are equipped with standard vacuum tubes. Since recording and control functions are separate, loss of control would show up on the record; process would still be under

Using this calibrating meter and a screwdriver, instrument men can calibrate a recorder in ten minutes — from time instrument is slid out from panel until it is again recording



This is how back of panel looks



Operator Charles Dale usually keeps tabs on Platforming process from desk in foreground. Here he takes a close look at the records

control

Calibrat
Two ac
screwdr
required
another
variable

In orde
panel o
supplie
own ho
position
would l

Even th
start up
Started
control

(Autro
wout C
12, Oh

(Graph
7401 N
informa

Elect
hand



Electronic instruments control Platformer

control if recorder went out.

Calibration of recorders is a simple ten minute job. Two adjustments, zero and span, are made with screwdriver and portable calibrating meter. When required, any recorder can be interchanged with another, or with a spare. Full range signal for any variable is the same.

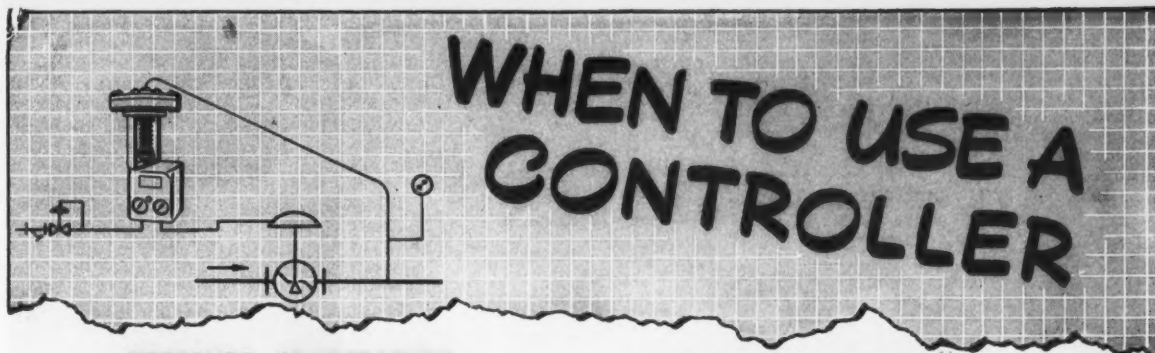
In order to simplify connections behind graphic panel of the Platformer, plug-connected wiring was supplied with instruments. Each unit plugs into its own housing. Circuits are so arranged that valve position in event of power failure is the same as it would be if air failed.

Even though most Platformers have been easy to start up, record at Rock Island was impressive. Started at 9:20 AM, Platformer was completely under control by ten.

(Autronic instruments are products of The Swartwout Co., Dept. CP, 18511 Euclid Ave., Cleveland 12, Ohio . . . or check CP 4589, pages 2 and 3.)

(Graphic panel was built by Panellit, Inc., Dept. CP, 7401 N. Hamlin Ave., Skokie, Ill. . . . or for more information check CP 4589A, pages 2 and 3.)

Electric-to-pneumatic relay (top center) has high air handling capacity to minimize valve operating time

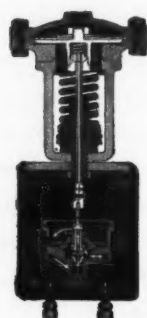


PRESSURE, TEMPERATURE AND LIQUID LEVEL CONTROLLERS

Leslie Controllers consist of a single or double seated diaphragm control valve operated by a Control Pilot. The latter is an air, water or oil actuated device that produces a variable loading pressure to the valve diaphragm in response to a pressure, temperature or level change in the controlled medium. Controllers are used for any one or any combination of the following conditions:

- ★ When an exactly controlled level, pressure or temperature is required.
- ★ When power is needed to assure automatic valve opening after prolonged, tight shut-off.

- ★ When power is needed to operate single-seated valves under high pressure drop.
- ★ When the available fluid pressure differential doesn't supply enough power for self-operation.
- ★ When extreme pressure reductions are necessary (i.e. 600 reduced to 10 psi, 900 to 2 psi, 2150 to 5 psi); all can be handled in one step.
- ★ When fluid contamination requires the simplest type regulating valve for dependable operation.
- ★ When operation from either a nearby or remote control station is desired.

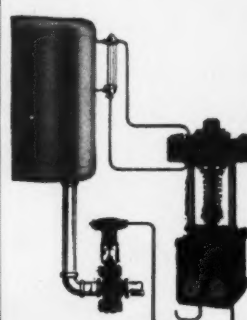


Control Pilot
Type PD

LESLIE CONTROL PILOTS

Simple mechanical device employing constant supply of clean air, gas, water or light oil at 20-22 psi to produce a variable output or loading pressure of 0-20 psi in response to a level, pressure or temperature change applied to operate a control valve or power cylinder controlling fluid flow.

SEND FOR BULLETIN 5303



Floatless Level Control
Type UA-1

LESLIE FLOATLESS LEVEL CONTROL

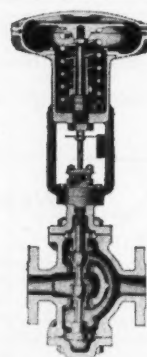
Provides accurate control of liquid level (plus or minus 1" water column). Eliminates problems caused by troublesome linkages, torque tubes, floats and stuffing boxes. Simple design provides steady, positive, precise control even under difficult conditions. Consists of Level Control Pilot and diaphragm control valve.

SEND FOR BULLETINS
5303, 5304, 5305

LESLIE DIAPHRAGM CONTROL VALVES (Double Seated)

Flow-line contoured body for high capacity, low pressure drop. Standard ISA face to face dimension in cast iron, cast bronze and cast alloy steels. Renewable, self-aligning guides. 1/2-10". To primary service rating of 600 psi-950° F. flanged, ring joint and welding ends.

SEND FOR BULLETIN 5305

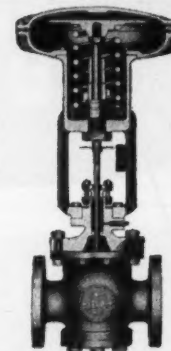


Diaphragm Control Valve
Double Seated Class DV

LESLIE DIAPHRAGM CONTROL VALVES (Single Seated)

Control flow of steam, liquid, air or gas. Tight shut-off. Operated automatically by air, water or oil pressure supplied from a Control Pilot or from a loading device such as LESLIE Air Loading panel. Available in unbalanced or fully balanced types, 1/2-10" in cast bronze, cast iron and cast alloy steels. Primary service ratings to 2500 psi, 1000° F.

SEND FOR BULLETIN 5304



Diaphragm Control Valve
Single Seated Class DL-1

LESLIE CONTROLLERS

SINCE 1900

LESLIE CO., 281 GRANT AVENUE • LYNDBURST, NEW JERSEY

When inquiring check CP 4590 on handy form, pgs. 2-3

Now!

An even BETTER Controller for simple processes!

...the improved Foxboro M/41A Indicating Controller



Here's the Foxboro Controller that proved itself in thousands of successful applications throughout industry! Now, with brand new design features, it's better than ever.

The M/41A Controller offers a new, snappy on-off action, or smooth proportional control action easily adjustable from .25% to 25%. It employs the famous M/40 controller movement — free from backlash, lost motion, and friction. This is a rugged, low-cost, compact controller using standard M/40 parts throughout... easy to get at... easy to service.

For control of simple processes—temperature, pressure, liquid level, or humidity — it will pay you to investigate the convenience and the precise, reliable performance of the Foxboro M/41A Indicating Controller. Write for Bulletin 5A-13.

New Design Features

- Longer Scale — 5" effective length.
- Snappy "On-Off" Control Action on measurement change of only $\frac{1}{4}$ of 1% of 1% scale.
- Alternate Proportional Action adjustable from $\frac{1}{4}$ of 1% to 25%.
- "Permaligned" Precision Controller Movement — Exclusive Self-Aligning Ball-Linkage—Non-Backlash Vernier Index Drive
- Simple Rugged Construction—All Parts Easily Accessible

THE FOXBORO COMPANY, 811 NEPONSET AVE., FOXBORO, MASS., U.S.A.

FOXBORO

REG. U.S. PAT. OFF.

INDICATING CONTROLLERS

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

When inquiring check CP 4591 on handy form, pgs. 2-3

INSTRUMENTATION

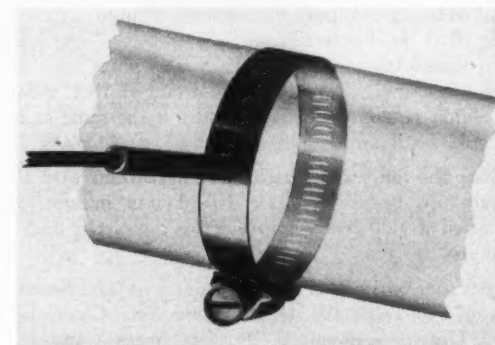
Find outside pipe temperature with adjustable pipe clamp thermocouple . . .

units may be installed without interrupting process flow or altering pipe

Uses: For measuring temperatures wherever immersion thermocouples are impractical or undesirable. Typical uses include checking insulation effectiveness, obtaining temperature gradients by use of multiple units, and obtaining temperature readings on alloy, plastic or glass pipes that are not easily entered.

Features: Installation of thermocouples can be made with screwdriver in less than a minute. Adjustable pipe clamp is available in sizes from $\frac{3}{8}$ " IPS through 4" IPS.

Description: Opened clamp assembly is placed around pipe, band end is slipped into worm gearing housing and tightened with screwdriver. Clamp assembly is stainless steel. Steel spring pro-



Twist of screwdriver installs pipe thermocouple

ducts thermocouple terminal in clamp. Lead wire (20 ga) is 18" long and is protected by silicone-impregnated, glass-over-asbestos, water-proof insulation. Thermocouples are available in copper-constantan for low temperatures or iron-constantan for temps to 1000°F.

(Adjustable pipe clamp thermocouples are product of Conax Corp., Dept. CP, 4515 Main St., Buffalo 21, N. Y. Check CP 4592, pages 2 and 3.)

Viscosity control system explained in folder

Illustrated four-page technical bulletin explains recording or recording-controlling of viscosity in chemical plants.

Tech Bul No. 16 is issued by Norcross Corp., Dept. CP, 247 Newtonville Ave., Newton 58, Mass. Specify CP 4593 on handy form, pgs. 2-3

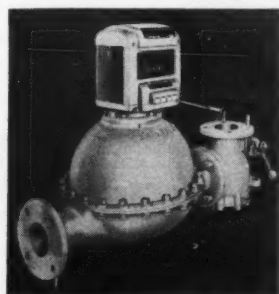
Automatically shuts off liquid when exact amount is delivered . . .

meter is positive displacement, nutating piston type which handles 150 liquids

Uses: For automatic control of water, syrups, solvents, oils and other liquids fed to batching and blending processes.

Features: Meter automatically cuts off flow when preset quantity of liquid is delivered. Double-trip valve slows down flow an instant before it trips shut, thereby eliminating hydraulic hammer. Unit handles about 150 different industrial liquids.

Description: Flow rates as high as 300 gpm are handled by positive displacement, nutating piston unit. Meter fits 3" pipe. To operate, tripper mechanism on register is set by pushing buttons on bottom of register until number of gallons or pounds appears on counter. Numerals are then cleared back to zero by turning reset handle on right side of register. Meter automatically cuts off flow when exact quantity of liquid is delivered. Flow can



Meter fits 3" pipes

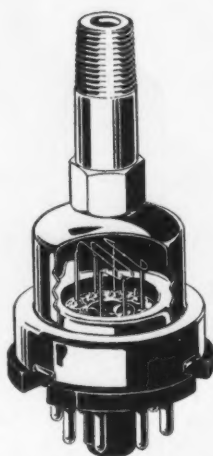
be stopped by pressing emergency stop button. Delivery can be continued after stopping without resetting register.

(Auto-Stop meter is product of Neptune Meter Co., Dept. CP, 19 W. 50th St., New York 20, N. Y. . . . or for more information check CP 4594 on handy form, pages 2 and 3.)

Uses thermal conductivity to analyze gases

Instrument designed for quantitative analysis of gas mixtures having one variable is illustrated and described in four-page bulletin. Analyzer operates by measuring thermal conductivity of gas. Instrument will analyze such binary mixtures as ammonia and air, argon and helium, carbon dioxide and air, carbon dioxide and nitrogen, helium and air, hydrogen and air, hydrogen and nitrogen, hydrogen and hydrogen chloride, methanol and air, propane and air, sulfur dioxide and air.

Bul on Universal Gas Analyzers is issued by Charles Engelhard, Inc., Dept. CP, 850 Passaic Ave., East Newark, N. J. When inquiring specify CP 4595 on convenient Reader Service slip located between pages 2 and 3.



SHORT WELDED NOBLE METAL ELEMENTS

withstand the vibration and shocks that ruin long wired gauge tubes. Elements are direct heated, reach operating temperature in less than one second.



New Hastings Vacuum Gauge Lasts 10 Times Longer

Short, direct heated elements can't be damaged by vibration or pressure changes

Here is a vacuum gauge that provides laboratory-type accuracy under industrial production conditions. Simple to operate. Dependable. Highly stable. Single knob control.

Standard instrument case model, complete with gauge tube.

ONLY \$100.00

Available with switching attachment and matched gauge tubes for master station indication of up to 29 points. Calibration accuracy independent of lead length or ambient temperature.

For further information wire HICO Instrument Division, Hastings Instrument Company, Warwick 10, Virginia.

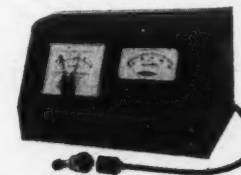
ALL HASTINGS VACUUM GAUGES

provide highest accuracy through the 1-1000 micron range. Direct reading logarithmic scale expands lower range indications. Panel mounted and instrument case models available with matched gauge tubes, switching attachment, strip chart recorder.



HASTINGS VACUUM CONTROLLER

automatically maintains vacuum systems in any desired range from 1-1000 microns with highest accuracy. Operates pump, alarm system, valves, etc. Response time 1/2 second. Internal voltage regulation.



HASTINGS INSTRUMENT COMPANY, INC.

Main Office and Laboratories • HAMPTON 10, VIRGINIA

When inquiring check CP 4596 on handy form, pgs. 2-3

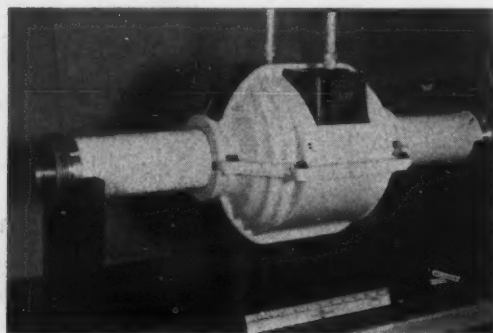
INSTRUMENTATION

**With no obstruction in line,
volume flow rate meter
gives 1% accuracy . . .**

electromagnetic meter handles liquids, slurries, corrosives, and other difficult-to-meter fluids

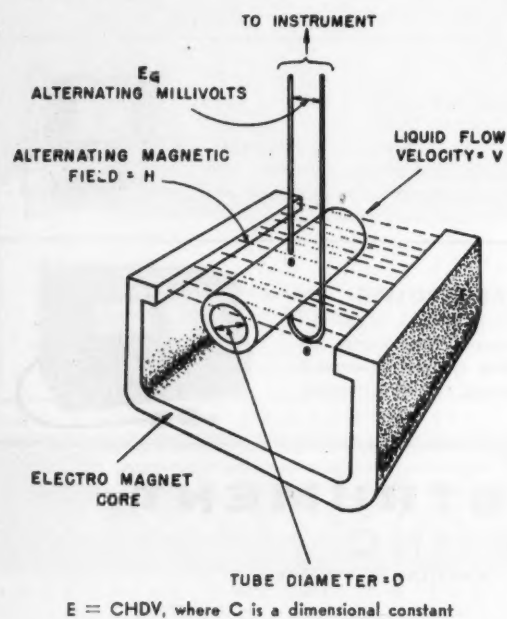
Uses: For measuring volume flow rate of liquids, slurries, acids, corrosives, and drug products having sufficient conductance and velocity to be metered by electromagnetic means.

Features: Pressure drop through transmitter is only that caused by length of tube. There are no pockets, crevices, or openings to obstruct flow or trap foreign material. When leads are interchanged,

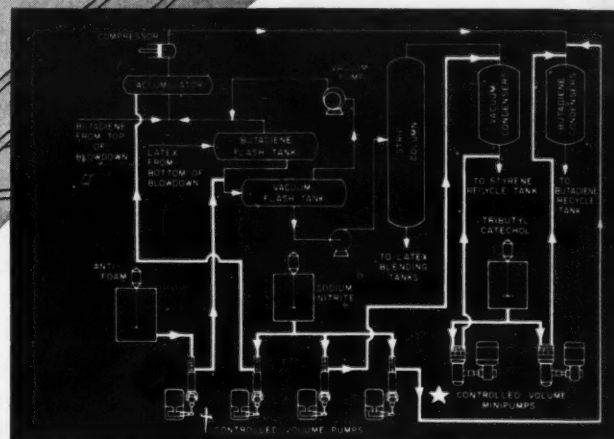
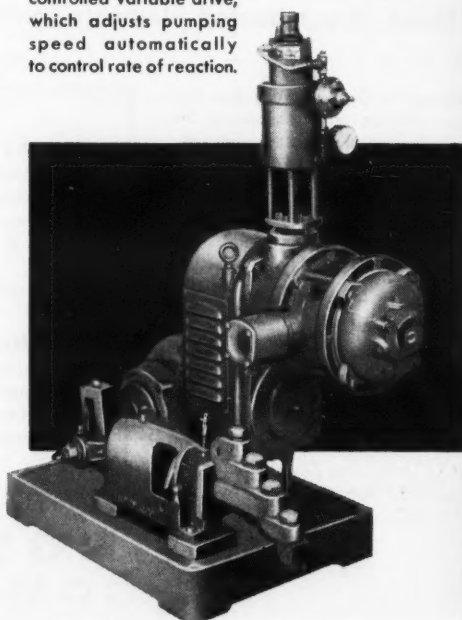


Meters volume flow rate of liquids with conductivity of 200 micromhos or greater

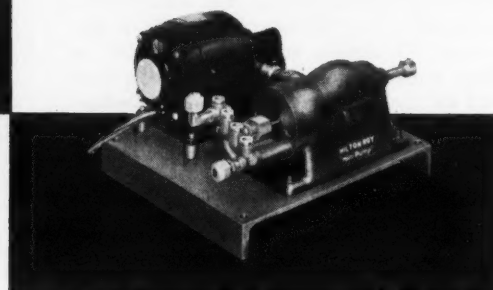
meter will measure reverse flow because of a differential transformer in null-balance circuit. Accuracy of unit is unaffected by turbulence or variation in flow profile.



Motor-driven controlled volume pump, with air controlled variable drive, which adjusts pumping speed automatically to control rate of reaction.



★ Two "minipumps" on recovery system accurately control addition of inhibitors to stabilize monomers following recovery.



W flow-control approach

guards product quality in continuous polymerization

Controlled volume pumps are flow control instruments

PRECISE flow control—accurate metering of catalysts, inhibitors, defoamers, and other additives—largely determines product quality in continuous polymerization of rubber. Milton Roy *controlled volume pumps* have taken over this flow control job with excellent results.—More precise control. No over- or under-treatment. Better product quality. Significant savings on costly additives.

Reason: controlled volume pumps are actually flow control instruments . . . particularly valuable for low capacity flows. Reciprocating, positive displacement type pumps, they pre-

cisely meter process additives to an accuracy of within 1%! Exclusive Milton Roy ball-type *step-valve* design assures accuracy with any viscosity liquid or slurry. Pumps are available in capacities up to 1350 gallons per hour . . . pressures up to 50,000 pounds per square inch . . . with manual or automatic speed and stroke adjustment.

Note diagram, left. Where can controlled volume pumps be profitably applied in your own process? Milton Roy offers you long experience in handling low capacity flow control problems . . . in engineering complete chemical feed and automatic control systems. Write for technical information. Or, send your problem to the Milton Roy Company, *Manufacturing Engineers*, 1300 East Mermaid Lane, Philadelphia 18, Pennsylvania.

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.

†

Standard motor-driven controlled volume pumps . . . three in Butadiene inhibiting service (preventing "popcorn" polymers) . . . other three meter accurate quantities of modifier, anti-foam and short-stop agents to process stream.



When inquiring check CP 4597 on handy form, pgs. 2-3

Description: Magnetic flow meter consists of flow transmitter, connected by electrical cable to receiver. Pneumatic or electrical control or alarm accessories can be added to receiver. Flow transmitter is a nonmagnetic tube with electrical insulating liner on outside. Electromagnetic field is induced through tube and material being measured. Two metallic electrodes (essentially flush with inside surface of tube) contact flowing liquid.

Output of transmitter is linear with average velocity of flowing liquid which is, in turn, proportional to volume flow rate. Transmitter's operation is based on Faraday's law of electromagnetic induction. Flow transmitters are available to fit 2, 3, and 4" sanitary tubing with minimum flow rates (gpm) of 50, 100, and 180, respectively. For schedule 40 pipe, five sizes are available — 2, 3, 4, 6, and 8". Minimum flow rates are 50, 120, 200, 450 and 800 gpm, respectively. Conductivity of measured fluid is not critical but must be at least 200 micromhos (approximately as conductive as tap water).

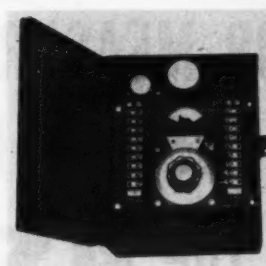
(Magnetic flow meters are a product of The Foxboro Co., Dept. CP, 86 Neponset Ave., Foxboro, Mass. . . . check CP 4598, pages 2 and 3.)

Provides interval timing, programming, repeat cycling to accuracy of one per cent

General purpose electronic timer may be used for interval timing, timed delay, repeat cycling, programming or pulsing. Designed for sequence control of automated equipment, timer has three time ranges: 0.1 to 1 sec, 1 to 10 sec,

or 10 to 100 sec. Unit maintains 1% accuracy over line voltage fluctuations of 90-135v. Two SPDT load contacts have 8-amp rating.

(Process timer is a product of Dept. F-6, Ferrara, Inc., Dept. CP, 8106 W. Nine Mile Rd., Oak Park 37, Mich. . . . check CP 4599, on form, pgs. 2-3.)



Need instrumentation for that process?

You'll find just what you need in the alphabetized, itemized Product Directory on pages 170 to 173. All subjects and products presented in ads and editorial columns are there.

CUT COSTS

REGULATE
TEMPERATURE OF

WATER AND OIL HEATERS
VATS • TANKS • DRYERS
METAL FINISHING PROCESSES
JACKET WATER COOLING
AND MANY OTHER USES

with **POWERS No. 11**
Self-Operating
TEMPERATURE
REGULATOR

Easy to Install
DEPENDABLE • ECONOMICAL
Controls temperature
of liquids or air

A premium quality regulator with these features that give better control and years of trouble-free service: has over-heat protection; valve stem lubricator helps give more accurate control, reduces packing gland maintenance; OILITE thrust bearing makes it easy to adjust temperature; available, when required, with easy to read 4" dial thermometer.

Write for Bulletin 329

Offices in 60 Cities, See Your Phone Book

THE POWERS REGULATOR CO., Skokie, Ill.

Over 60 Years of Automatic Temperature and Humidity Control

When inquiring check CP 4600 on handy form, pgs. 2-3

For Accurate TEMPERATURE RECORDS at MODERATE COST

RANGES AVAILABLE	
Temperature Range	One Rotation of Chart
-30° to +120° F.	7 Days
-30° to +120° F.	24 Hours
-20° to +40° F.	24 Hours
-20° to +40° F.	7 Days
-10° to +50° F.	24 Hours
-10° to +50° F.	7 Days
-10° to +50° F.	24 Hours
-10° to +50° F.	7 Days
30° to 60° F.	7 Days
40° to 100° F.	24 Hours
60° to 90° F.	24 Hours
60° to 90° F.	8 Hours
70° to 130° F.	24 Hours
70° to 130° F.	8 Hours
100° to 160° F.	24 Hours
25° to +10° C.	24 Hours
5° to 40° C.	24 Hours

Use TEMPSCRIBE Recorders

The TEMPSCRIBE self-registering Recording Thermometer meets a long-felt need for a moderately priced recorder for general purpose applications where a graphic record of temperature in surrounding air is required. The record—written on an easy-to-read chart, 4" in diameter, with graduations spaced uniformly over full range—is indispensable wherever knowledge is desired if temperature goes above or below any given point. TEMPSCRIBE is the only recorder made with pen and actuating element in door, which, when opened, permits a clear view of the complete chart, and easy chart replacement without danger of damaging pen arm or accidentally marking chart.

Write for Bulletin 704

BACHARACH INDUSTRIAL INSTRUMENT CO.
7301 Penn Avenue • Pittsburgh 8, Pa.

When inquiring check CP 4601 on handy form, pgs. 2-3

FOR MEASUREMENT and CONTROL of VISCOUS FLUID FLOW...

the **ASKANIA** TRANSOMETER

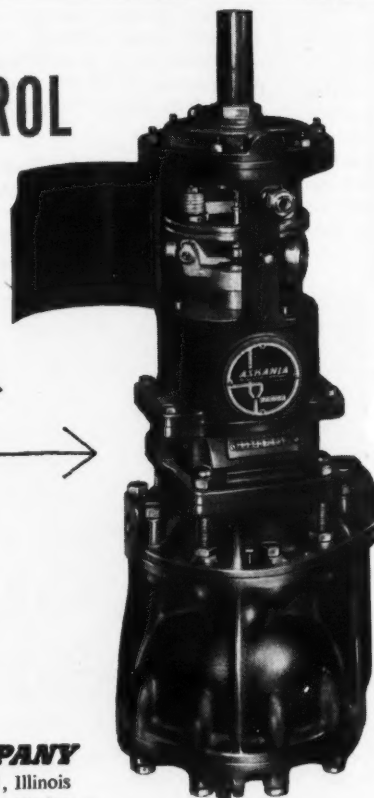
Designed for fuel oil and other viscous liquids, the Askania Transometer accurately measures flow and transmits a corresponding pneumatic signal.

This signal can be in the range of inches w. c., to match equivalent gas flow measurement; or in the standard instrument transmitter range of 3-15 p.s.i.

Sturdy Askania construction, over-range protection, built-in integrator, wide range. Write for Bulletin 125.

ASKANIA  **REGULATOR COMPANY**
242 E. Ontario Street, Chicago 11, Illinois
Subsidiary of General Precision Equipment Corp.

When inquiring check CP 4602 on handy form, pgs. 2-3



INSTRUMENTATION

**Heavy duty pressure cells
can be screwed on pipes
with wrench...**

heavy case and welded assembly makes cell rugged enough for oil pipeline use

Uses: Designed as pressure sensing element for remote pressure-measuring, controlling, and telemetering.

Features: Similar to manufacturer's SR-4 cells, Type B-1 has heavy steel case and welded assembly which makes cell strong enough for pipe wrench tightening. Stronger signals for telemetering are provided by wire strain gages of 175 ohms resistance instead of usual 120 ohms.

Description: Pressure sensitive cell in contact with fluid is Type 410 stainless steel. Eight sizes from 100 to 2000 psi range are available for use wherever service conditions are similar to those encountered in oil pipeline installations.

(Type B-1 SR-4 pressure cells are products of Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Eddystone 42, Pa. . . or for more information check CP 4603 on handy form, pages 2 and 3.)

**Determines dissolved oxygen content
in plant process streams
by paramagnetism...**

system is adaptable for liquids carrying large amount of solid materials

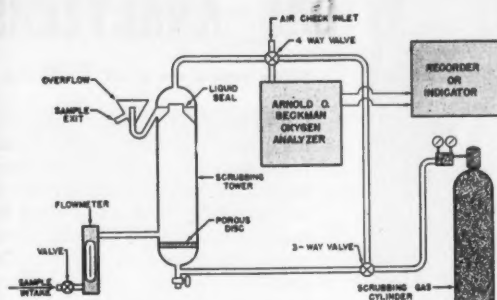
Uses: For continuous measurement of dissolved oxygen in fluid process streams. Typical industrial applications include sewage effluent, water treatment, petroleum products, chemicals, and solvents.

Features: Hydrogen, nitrogen, helium or other gases as required may be used as scrubbing gas. Scales may be either in per cent saturation or parts per million.

Description: Unit consists of gaseous phase oxygen analyzer and scrubber. Components are mounted and interconnected in metal cubicle. Standard potentiometer recorder may be mounted in cubicle or located remote with use of two-wire cable. Paramagnetic oxygen analyzer is adjusted to read zero on an oxygen-free scrubbing gas, and is then used to measure volume per cent of oxygen in gas issuing from stripper column.

In operation: 1) continuously flowing sample enters scrubbing tower, overflows weir at top of tower, and is wasted through overflow drain; 2) scrubbing gas enters bottom of tower through porous disc at rate of 15 cc per minute; 3) scrubbing gas is dispersed through fluid; 4) dissolved

INSTRUMENTATION



oxygen leaves liquid and enters bubbles of scrubbing gas in accordance with Henry's Law; 5) amount of dissolved oxygen collected by bubbles of scrubbing gas is proportional to degree of oxygen saturation of solution, and 6) scrubbing gas and oxygen are collected in dome above weir and fed to oxygen analyzer.

Minimum range of instrument is 0.5 ppm of dissolved oxygen. Output of unit is 0-25 mv from power supply of 115v, 60 cy AC.

(Mod 1A3B dissolved oxygen analyzer is a product of Arnold O. Beckman, Inc., Dept. CP, 1020 Mission St., South Pasadena, Calif. . . or for more information reader may simply check CP 4604 on the convenient Reader Service slip located between pages 2 and 3.)

Converts signal from Venturi tube or orifice to air pressure for transmission . . .

unit makes possible remote location of instruments — only 0.1 cfm is required

Remote pneumatic transmitter permits location of instruments at greater distances from primary devices without regard for hydraulic elevations at point where instruments are located. Unit balances single air pressure against any differential pressure produced by Venturi tube, flow nozzle, orifice plate, or difference between two existing levels or pressures. Pressure is then transmitted and used by remotely-located instrument. Air consumption at transmitter is about 0.1 cfm.

Device consists of differential converter (fluid pressure to air pressure) and bellows receiving mechanism which translate air pressure into terms of measurement for flow or pressure indicating or recording instrument.

(Laminair transmitter is a product of Simplex Valve & Meter Co., Dept. CP, 68th and Upland Sts., Philadelphia 42, Pa. . . or for more information reader may simply check CP 4605 on the convenient Reader Service slip located between pages 2 and 3.)

IT'S NEW! "316" Stainless Steel Meter with Quantity Control Valve

FOR CORROSIVE LIQUIDS



Controls Cost — Controls Quality

Here's a new money-saving tool for you who blend, batch or otherwise process alcohols, vegetable oils, deionized water and corrosive liquids. It's the popular all-stainless steel Rockwell Rotocycle meter fitted with a pre-determining register and an automatic shut-off valve. You just set the quantity you wish the meter to dispense and when this quantity has been measured, the flow is stopped. The stainless steel control valve is of the multi-stage type to avoid hydraulic shock. Use the handy coupon for full details.

ALL TYPES OF INDUSTRIAL METERS Rockwell makes all sizes and types of meters for use by industry. With them you can get positive metered accounting for a multitude of liquids. You can guard the quality of your formulations, keep tab on liquid inventories, have accurate records for cost control and tax analysis purposes. Now is the time to *meter and save*.

CLIP COUPON—MAIL TODAY

Rockwell Manufacturing Company		Dept. 106A
Pittsburgh 8, Pennsylvania		
Gentlemen:		
I am interested in measuring _____		(Name of Liquid)
Pipe Size _____"		
Working Pressure _____ psi	Temperature _____ °F max.	
Max. Flow Rate _____ gpm	Min. Flow Rate _____ gpm.	
YOUR NAME _____		
COMPANY _____		
STREET _____		
CITY _____	ZONE _____	STATE _____

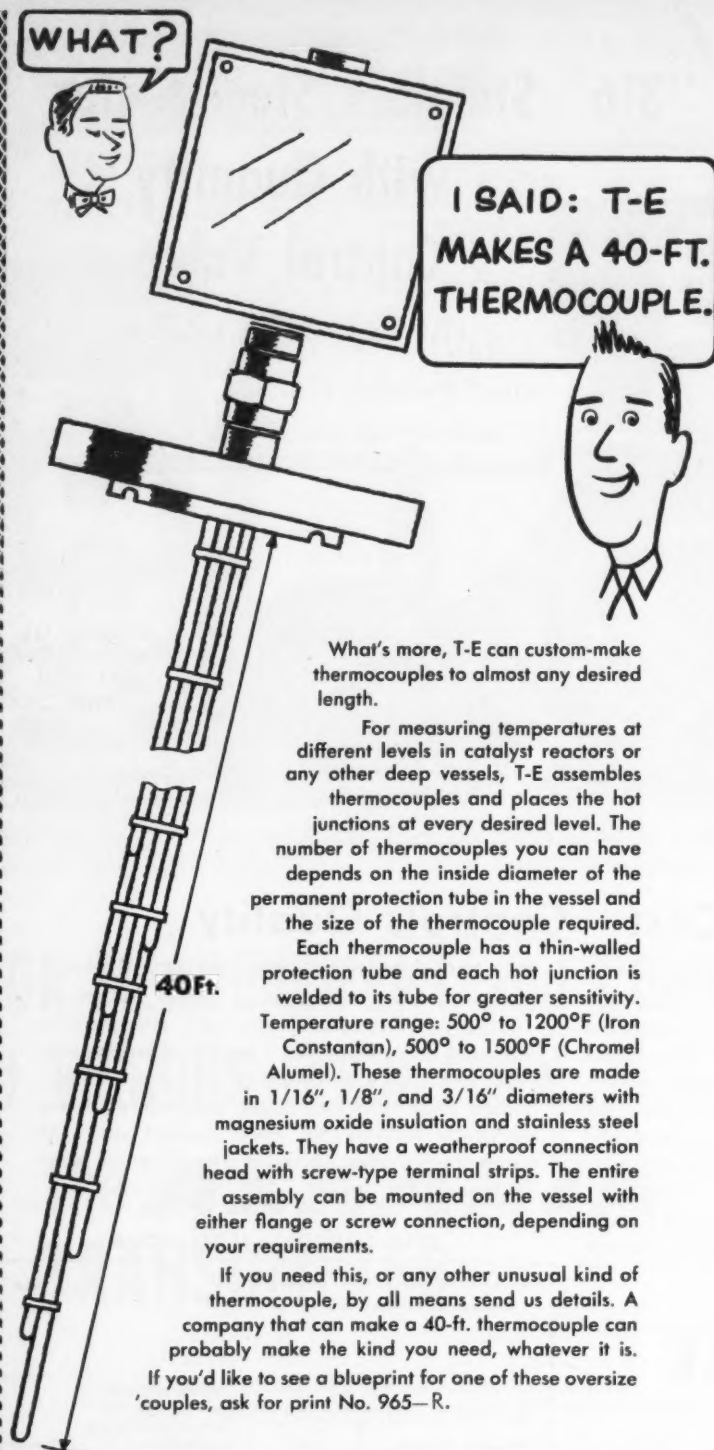
ROCKWELL
INDUSTRIAL
METERS



YOU CAN RELY ON ROCKWELL

When inquiring check CP 4606 on handy form, pgs. 2-3

WHAT?



What's more, T-E can custom-make thermocouples to almost any desired length.

For measuring temperatures at different levels in catalyst reactors or any other deep vessels, T-E assembles thermocouples and places the hot junctions at every desired level. The number of thermocouples you can have depends on the inside diameter of the permanent protection tube in the vessel and the size of the thermocouple required.

Each thermocouple has a thin-walled protection tube and each hot junction is welded to its tube for greater sensitivity. Temperature range: 500° to 1200°F (Iron Constantan), 500° to 1500°F (Chromel Alumel). These thermocouples are made in 1/16", 1/8", and 3/16" diameters with magnesium oxide insulation and stainless steel jackets. They have a weatherproof connection head with screw-type terminal strips. The entire assembly can be mounted on the vessel with either flange or screw connection, depending on your requirements.

If you need this, or any other unusual kind of thermocouple, by all means send us details. A company that can make a 40-ft. thermocouple can probably make the kind you need, whatever it is. If you'd like to see a blueprint for one of these oversize 'couples, ask for print No. 965—R.

Pyrometers • Temperature Monitoring Systems • Thermocouples • Protection Tubes
Quick-Coupling Connectors and Panels • Thermocouple and Extension Wires

Thermo Electric Co., Inc.

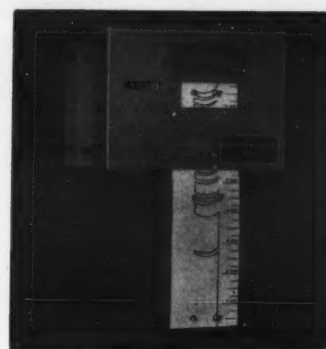
SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 4607 on handy form, pgs. 2-3

INSTRUMENTATION

Continuously records process cycles on tape

Time recorder and totalizer gives uninterrupted record of operation of machines or other process equipment. On continuous tape, instrument records chronologically when



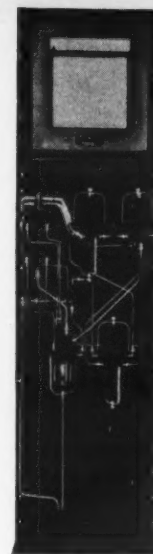
process is on or off. Unit operates on automatic or manual controlled machines. Total operating time can be read out on totalizer. Units are tamperproof and easy to install.

(Time-Recorder-Totalizer is a product of Heat-Timer Corp., Dept. CP, 657 Broadway, New York 12, N.Y. . . . or for more information check CP 4608 on handy form, pages 2 and 3.)

Illustrates and describes telemetering systems

Illustrated 44-page bulletin illustrates and describes line of telemetering equipment. Bulletin features microwave telemetering, telemetering with selective calling, and time multiplexing telemetering. Application illustrations are given on telemetering installations for measurement and transmissions of pressure, flow, liquid and water level, mechanical motion, electrical units, and totalized power load.

Bul M1710 is issued by The Bristol Co., Dept. CP, 143 Bristol Road, Waterbury 20, Conn. When inquiring specify CP 4609 on handy form, pages 2 and 3.



3-POINT RECORDING GAS ANALYZERS (CO₂, H₂, CO)

CAMBRIDGE GAS ANALYZERS

Labor saving — profit producing

Cambridge Gas Analyzers continuously analyze and simultaneously record on one chart from one to six constituents of a gas. They may be used for most simple and many complex mixtures of gases. Dependable and labor-saving, these Analyzers make possible increased efficiency and savings in the operation of steam generating plants, cement kilns, blast furnaces; in the production of inert gases; in metallurgy, in petroleum refining and other chemical processes.

Send for literature mentioning application

CAMBRIDGE INSTRUMENT COMPANY INC.

3706 Grand Central Terminal, New York 17, N.Y.

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

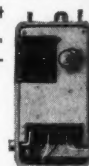
When inquiring check CP 4610 on handy form, pgs. 2-3

ACCURATE

Lumenite Electronic LIQUID LEVEL CONTROLS

With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers—either open or under high pressure.

Clean—Sanitary
Simple to Install
Require no Servicing



Write for
Bulletin FLM—on Liquid Level Controls
Bulletin ITC—on Ice Thickness Controls
Bulletin FN—on Non-Conductive Liquids

Lumenite Automatic TIMING CONTROLS

Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.

For Details ask for
Bulletin LT—Standard Time Switches
Bulletin CR—Cycle Repeating
Bulletin PC—Program Clocks
Bulletin R—Time Delay Relays
Bulletin RMC—Auto. Reset Timers
Bulletin ET—Electronic Timers
Electronic or Electric Controls
and Timers designed for special service.

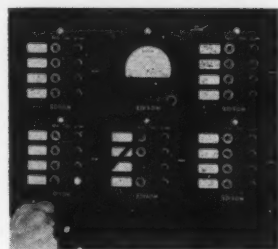
Lumenite Electronic Company

407 S. Dearborn St., Chicago 5, Illinois

When inquiring check CP 4611 on handy form, pgs. 2-3

DEPENDABLE

Multiple-point temperatures can be checked without scanning



Alarm lamp signals when
temperature nears set point

Uses: For monitoring up to several hundred temperature check points.

Features: Unit sounds alarms when temperature set point is exceeded at any location. Building-block design permits additional units to be added without disturbing or affecting existing units or wiring.

Description: Omniguard monitoring system uses resistance temperature detectors which can be installed in bearings, oil lines, ducts, tanks. Detectors are available in range from -100 to approximately 1350°F.

Temperature setting of each point is accomplished on panel without special tools or personnel training. Each monitor unit is self-contained and can be re-



Each point can be set on-the-spot with screwdriver and substitute resistance in place of temperature detector. Plug-in units simplify servicing

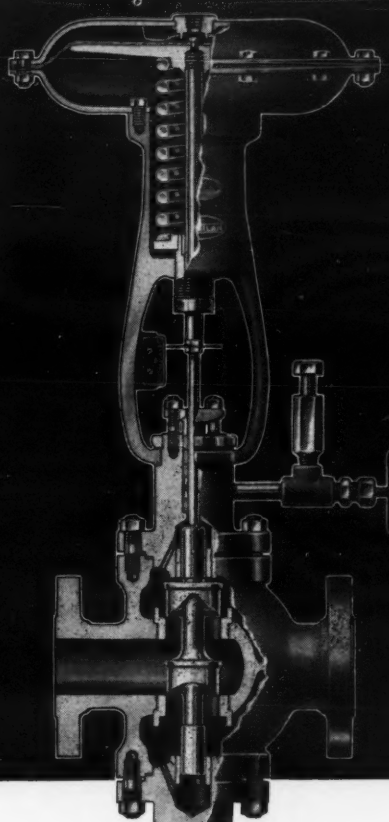
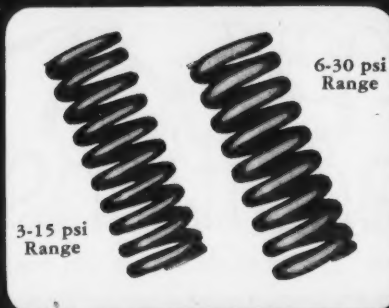
moved from panel without disconnecting single wire. Original installation can be increased by any multiple of four points to include several hundred stations. (Omniguard temperature monitoring system is a product of Instrument Div., Thomas A. Edison, Inc., Dept. CP, West Orange, N.J. . . or for more information check CP 4612, pages 2 and 3.)

Hand tachometers shown in two-color bulletin

Hand tachometers with three separate speed ranges are shown in illustrated four-page bulletin. Instrument may be used for measuring speeds of rotating parts or moving surfaces.

Bul 103 is issued by Metron Instrument Co., Dept. CP, 432 Lincoln St., Denver 3, Colo. When inquiring specify CP 4613, pages 2 and 3

6-30 PSI SPRING RANGE



Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

For Extra Power

Doubles the power to operate the valve when conditions make it desirable or necessary.

Makes initial spring force up to 4000 pounds available for large air-to-open single seated valves operating at high inlet pressures.

Provides large operating force at beginning of stroke.

But No Extra Bulk

Compact, because diaphragm motor with, for example, 200 sq. in. effective area becomes equivalent to 3-15 psi motor with 400 sq. in. effective area.

And No Extra Cost

Both 3-15 and 6-30 psi spring ranges are "standard" — there is no extra charge for the higher range.

NOTE: There is a nominal extra for oversized motors which give you even greater power where necessary.

Operating Air is No Problem

because

Masoneilan Pneumatic Controllers are available with 6-30 psi (as well as 3-15 psi) output at *no extra cost*.

Masoneilan Positioners are available with either 3-15 or 6-30 psi input and/or output at *no extra cost*.

Masoneilan Boosters (1 to 2 input-to-output ratio) may be used with 3-15 psi output instruments without positioner.

More details on the uses of this versatile spring range sent on request.

... in Masoneilan Control Valves

MASON-NEILAN REGULATOR CO.
1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

When inquiring check CP 4614 on handy form, pgs. 2-3



new
additions

to this comprehensive line of
MODERN PRECISION PORTABLES

WESTON 901 LINE

D-C

- Voltmeters
- Volt-Ammeters
- Ammeters
- Milliammeters

A-C

- Voltmeters
- 8 Range Voltmeters*
- Ammeters
- 7 Range Ammeters*
- Milliammeters

A-C and D-C
single-phase Wattmeters*

Providing unequalled scale visibility due to wrap-around windows, the same rated accuracy of 0.5% and the same efficient shielding of all other instruments in this famous line, these three new additions make the 901 group the most comprehensive line of precision portables available. Complete specifications and prices available in bulletin form, or from the WESTON representative in your vicinity... WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.

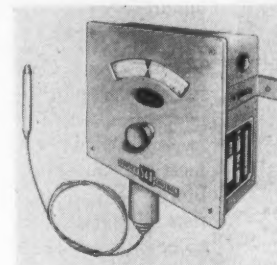
WESTON
Instruments

When inquiring check CP 4615 on handy form, pgs. 2-3

INSTRUMENTATION

Uses liquid-filled bulb and capillary to indicate and control temperatures . . .

DPDT relay rated for 15 amp at 115 volts



Indicates and controls temperatures up to 700°F

Flush (or surface) mounted indicating temperature controller operates in range from 100 to 700°F with uniform sensitivity throughout range. Instrument operates on liquid-filled bulb and capillary system whose response to temperature change is transmitted to bellows

assembly and indicating pointer through mechanical linkage. Backlash is eliminated at all linkage points by spring-loading final level element to keep all bearings in series tightened.

Control temperature is set with adjusting knob on front panel. Adjustable differential can be varied between 0.8 and 4 percent of scale range enabling user to adjust operating bandwidth to obtain lower cycling rate.

Bellows assembly is self-compensating for changes in ambient temperature in range from 50 to 150°F.

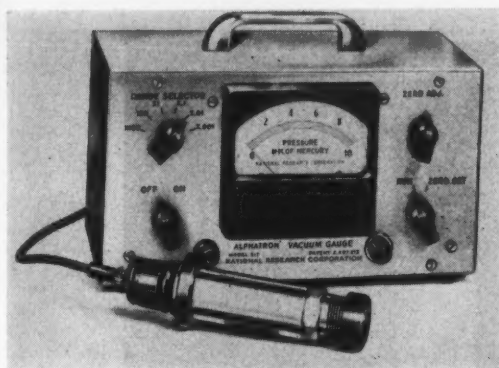
Unit may be exposed to temperatures as low as -65°F without damage. Capillary tubes are available in standard lengths of 6 or 10 feet. Overall accuracy of controller is about one percent and not more than 3% under most extreme conditions. Case is approximately 6¾" square and 2¾" deep.

(Series 540 controllers are products of Fenwal, Inc., Dept. CP, 243 Pleasant St., Ashland, Mass. . . or for more information check CP 4616 on handy form, pages 2 and 3.)

Uses alpha rays to measure vacuums as low as 0.0001 mm Hg with instant response . . .

instrument has connection for 10 mv recorder

Vacuum gage uses ionization effect of alpha particles radiation from permanent 400-mg radium source. Instrument operates on principle similar to ordinary hot-filament ionization gages only without hot filament. Alpha particles flowing at constant rate from radium source ionize gas molecules which are collected. Current produced is amplified to drive meter which indicates pressure in ionization chamber. Ionization currents are in the order of 10^{-13} amp and are amplified. Since



ion current is directly proportional to number of ions collected at given time, response of gage is linear with respect to pressure throughout its range for dry air.

Specifications of Model 517 Alphasatron vacuum gage follow:

Range: 1000 to 0.0001 mm Hg
 Speed: Instantaneous to 0.001 mm
 Response: Linear
 Standard Calibration: Dry air
 Max Zero Drift: 10% in 24 hours
 Accuracy: 2% of full scale
 Control Box Size: 7 x 10-11/16 x 5"
 Sensing Head Size: 1 1/4" OD x 5 1/2"
 Power Supply: 115v, 50/60 cy AC

(Mod 517 Alphasatron vacuum gage is a product of Naresco Equipment Co., subsidiary of National Research Corp., Dept. CP, 160 Charlemont St., Newton Highlands 61, Mass. . . or for more information check CP 4617 on handy form, pages 2 and 3.)

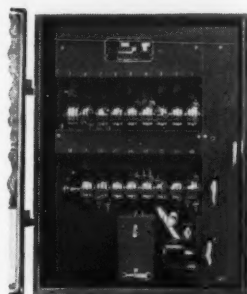
Shows data processing instruments and explains their operation

Illustrated 12-page general catalog furnishes information on company's complete line of data-processing equipment, which ranges from miniature transducers to entire instrumentation systems. Photographs, technical specifications, and descriptive functional diagrams explain uses of various instruments. Recording oscillographs, galvanometers, amplifiers, power supplies, matching networks, velocity and pressure pickups, vibration meters, oscillogram processors and analog-to-digital converters are among subjects treated.

Bul CEC-1301 is issued by Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. When inquiring specify CP 4618 on convenient Reader Service slip, pages 2 and 3.

Why Automatic Sequencing of Batch Operations \$AVE\$ DOLLAR\$. . .

...because the Taylor FLEX-O-TIMER® Time Cycle Controller "does its own thinking"—takes care of as many as 36 operations automatically, thus saving operator man hours!



The Taylor Flex-O-Timer Time Cycle Controller

THIS dividend-paying instrument is the Taylor FLEX-O-TIMER Time Cycle Controller. It provides precise, automatic timing of the sequence and duration of up to 36 processing operations involving temperature, pressure, mechanical motion, electrical energy or combinations. There are hundreds of applications throughout industry where this versatile controller can insure greater uniformity of processing, save operator effort—both physical and mental—and save you money. If you say "yes" to any of these questions it will pay you to call in your Taylor Field Engineer now.

Q. Do you have batch processes requiring personnel to perform multiple operations in sequence with complete reliability?

A. The Taylor FLEX-O-TIMER Controller enables you to coordinate batch processes to meet the requirements of a continuous process. You don't have to rely on people to turn the valves or perform other operations at the right time; e.g., the regeneration of a contaminated catalyst bed in a continuous process. The FLEX-O-TIMER Controller will:—stop the process; clean out process fluids; backwash the bed—or burn out the impurities; put the unit back on stream. All this automatically and in accordance with the best practices.

Q. Are you faced with reprocessing and consequent costly waste if certain manual operations do not take place at the right time, in the right sequence and for the correct duration?

A. You eliminate the possibility of human error with this robot brain in control. You can depend on the FLEX-O-TIMER Controller to turn the valve, pull the switch or perform other operations—automatically; e.g., the molding of plastics or vulcanizing of golf balls.

Q. Can customer dissatisfaction ever be traced to variations in product quality due to processing irregularities?

A. Once you've developed the optimum time, temperature, pressure and other variables for a process you can be sure of repeating that process *exactly*, time after time; e.g., backwashing of filter beds in a continuous process. Result: You are assured of a uniformly high quality product—the secret of repeat business.

Q. Wouldn't you consider it a good investment if a completely automatic sequencing control system applied to your batch processes paid off in a year or less?

A. Many chemical plants have increased their profits by revamping their batch processes in this way, using the Taylor FLEX-O-TIMER Controller as the key instrument; e.g., the operation of hydraulic presses in removing excess chemical from fibrous materials; plastic press operation; dry ice molding; the lamination of plywoods; tire molding; the opening and closing of dump valves in paper pulp bleach cells; the batch hydrogenation of edible oils and fats.

Q. Why is this system so successful?

A. Because Taylor Instrument Companies have the necessary experience and know-how to apply instrumentation of this kind to the best advantage in many diversified industries. Taylor Engineers have acquired this skill through many years of working in the field with instrument men and engineers. Their knowledge is at your disposal. Why not write today! Also ask for Bulletin 98154. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

Taylor Instruments
MEAN ACCURACY FIRST

When inquiring check CP 4619 on handy form, pgs. 2-3



NOW...VYFLEX L-10 FLEXIBLE LINING Stops Corrosion...Takes Hard Wear

Kaykor Vyflex L-10 is a new solution to your old corrosion problems. Based on Polyvinyl Chloride resins it provides the broadest range of corrosion resistance—withstands the toughest kind of abrasion and mechanical abuse—is far easier to apply.

Vyflex L-10 resists acids, alkalis, salts, plating solutions, and organic compounds at temperatures up to 160°F. Even protects your equipment and parts against oxidizing acids like chromic, nitric, and phosphoric, and highly concentrated, strong alkalis.

Vyflex L-10 provides an unparalleled combination of physical properties, too. Because it is inherently elastic, thermal expansion and contraction will not crack L-10, and the effects of mechanical abuse will be minimized. Good insulating properties mean no current loss from L-10 lined vessels in electrolytic reactions. And the inherently smooth, highly polished surface of L-10 simplifies cleaning, speeds solution flow, and provides superior abrasion resistance. The material is available both black and white.

L-10 IS EASIER TO APPLY. Introduction of L-10 means that lining can now be accomplished in the field as well as in the shop... accomplished in less time. Whether applied to steel, wood, or concrete, no curing is required. Qualified and experienced lining facilities are available through the greater part of the country.

GET THE FACTS! The complete story on Vyflex L-10 is provided in "Facts You Should Have On Vyflex L-10" and Engineering Bulletin L-10. Write Kaykor Industries for your free copies. Kaykor will also be happy to send you complete information on other Vyflex products, including F-92 Unplasticized Polyvinyl Chloride plate, sheeting, pipe, duct, and fittings; "G" (rubber-resin blend) sheet and plate; and Polyethylene sheet and plate.

VYFLEX
TRADE MARK REG. U.S. PAT. OFF.

Inquiries from lining applicators will be carefully considered.

KAYKOR INDUSTRIES, Inc.

Division of Kaye-Tex Manufacturing Corp.

4401 BROAD STREET • YARDVILLE, NEW JERSEY

When inquiring check CP 4620 on handy form, pgs. 2-3

corrosion control

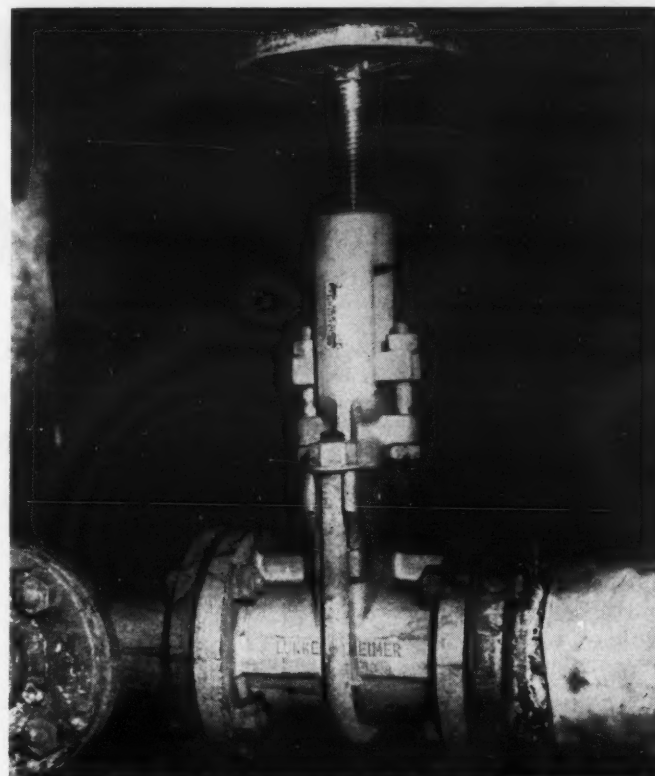


Fig 1—Ten years service has been furnished so far by this valve installed in corrosive liquor line

Economical, yet corrosion-resistant, gate valves —

resist corrosive black liquor

**From ten to fifteen years service
furnished by valves without need
for new parts or packing**

Problem: All-iron valves used for handling corrosive black liquor had a very short service life. Valves were being used at a large paper company in the Southeast in conjunction with the evaporation process of a normal kraft mill. Evaporators handle black liquor from pulp washing process. Black liquor contains soluble solids which consist of chemicals to be recovered for use in cooking, Na_2O , and a low percentage of residual caustic.

Solution: Company installed a number of Causul Metal valves on evaporator lines

to handle the corrosive black liquor. Fig 1 shows a valve placed in service during the period 1943-45. This valve is in a line coming from the fourth effect of a kraft mill evaporator. It is handling black liquor at 25% soluble solids. Total Na_2O content of liquor is about 6.0% by weight and its average temperature is 180°F.

Fig 2 shows valves installed during the period 1939-42 in evaporator product lines. Black liquor handled by these valves contains 50% soluble solids. Total Na_2O content is approximately 12.5% by weight and average temperature is 225°F.

Causul Metal is an austenitic cast iron of specific composition, containing special alloying elements. The word "Causul" was suggested by resistance of material both to CAUSTICS and to SULFURIC acid. Alloy was

Fig 2

developed with low carbon content. More of a valve than other products. 316 stainless steel economy body. Inexpensive yet capable of resisting corrosion.

Results: from ten to fifteen years service. After one of the valves (Causul Metal) Lunker 14, OH

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N. Y.

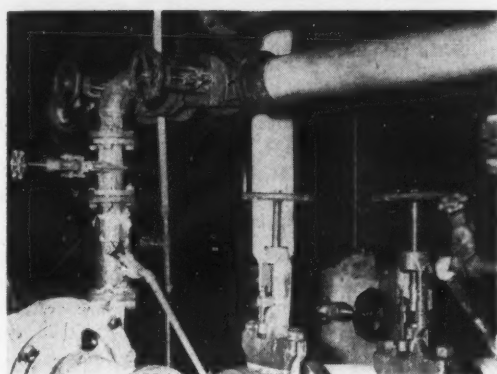


Fig 2—Heavy black liquor has been handled by these valves for the past fifteen years

developed in order to combine corrosion resistance with low cost for many common corrosive applications.

More corrosion resistance is required in the trim of a valve — its stem, seat ring, and disc — than its other parts. For this reason, alloys such as Monel or 316 stainless steel are used for the trim and the more economical austenitic cast iron used for the valve body. In this way a product is obtained that is less expensive than an all-Monel or all-stainless valve — yet capable of providing satisfactory service for those corrosive applications for which it is suitable.

Results: Causul Metal valves have provided from ten to fifteen years service without need for any new parts or packing. No repairs have been needed during the ten years service obtained so far for valve illustrated in Fig 1.

Valves shown in Fig 2 have furnished fifteen years service without need for any new parts or packing. After 15 years it was necessary to remove only one of this group because of body corrosion.

(Causul Metal valves are manufactured by The Lunkensheimer Co., Dept. CP, Box 360, Cincinnati 14, Ohio . . . check CP 4621, pages 2 and 3.)

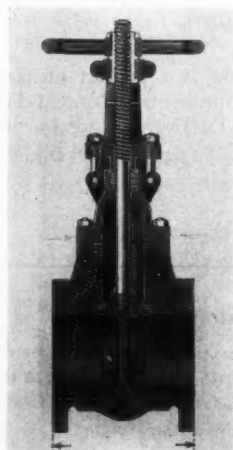
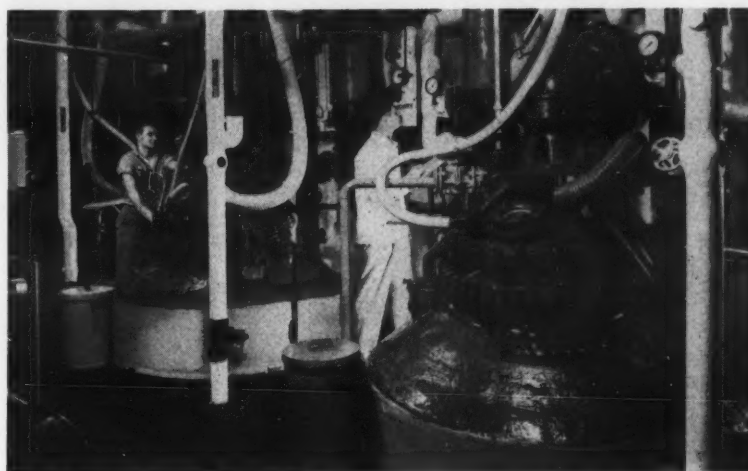


Fig 3—Cross section of Causul Metal gate valve, having either Monel or 316 stainless steel trim



How DPi, Leading Vitamin E Producer Maintains Absolute Product Purity

Concentrating and purifying Vitamin E from natural vegetable oils is a delicate job. It's the "house specialty" of Distillation Products Industries, a division of Eastman Kodak Company.

By molecular distillation, DPi produces tocopherols in a number of forms. In every phase of their process — particularly the final step — extreme care must be taken to protect these products from contamination.

Critical Stage

The final stage in DPi's preparation of Vitamin E requires the protection of Pfaudler glassed steel reaction kettles. Fortified with an acid-alkali resistant inner surface, these reactors

resist all forms of chemical attack, protecting the product from contamination.

Use of Pfaudler glassed steel equipment typifies the care that has made DPi a leader in the research and production of Vitamin E, as well as Vitamin A and distilled monoglycerides.

You too can profit by using Pfaudler glassed steel reactors. They are available in a complete range of capacities, from laboratory to full-scale production. When you make use of the custom features Pfaudler has incorporated in their standard design, you are able to get delivery on these reactors within two weeks.

How to Cool Off a Heat Exchanger Problem

With new processes on the horizon every day, Pfaudler engineers are receiving more and more requests for special features on heat exchangers.

To save you money on these designs, they have found that Pfaudler "flexible standard" stainless steel heat exchangers can be used as the base unit in a high percentage of cases.

For example, nozzles of any size — either flanged or threaded — can be installed in any position. And new production line methods make possible rapid deliveries — as few as 7 days!

To solve your problem, Pfaudler sales engineers can select from a complete line of heat exchangers — fixed tube sheet, single or multipass, tube and/or shell side stainless steel units. Shell diameters range from 4" to 24" in four basic types of construction: fixed tube sheet . . . outside packed floating head design . . . internal floating head . . . U-tube bundle. Most have removable tube bundles.

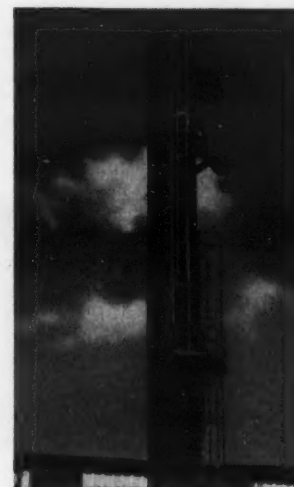
To take the heat off that heat transfer problem, discuss it with your Pfaudler representative. He has plenty of equipment to choose from.

Tall Story Lies Behind This Canadian Column

Two-thirds of this giant column was fabricated from stainless steel. The rest is carbon steel.

Seventy-seven feet high, the column projects into the sky above Canadian Chemical Company's plant at Edmonton, Alberta. It is a good example of the type of design and fabricating attention your problem will get when you turn it over to Pfaudler engineers.

In this case, a column was needed for a big, and very specific type of job. Seventy-seven feet high by 54 inches in diameter, it required custom fabrication.



Giant column has 40 sieve trays, is made of two types of steel.

Ordinarily, Pfaudler engineers are able to use economical standard units to solve problems of distillation, fractionation, stripping, bleaching and absorption. This saves you money, gives you the advantage of interchangeable components and uniformity of equipment designs.

To give you long-life equipment, Pfaudler offers a complete range of corrosion-resistant materials. This includes stainless steel, Hastelloy, monel, nickel, inconel, aluminum, glassed steel, and others.

Cut your equipment costs, and get the advantages of unbiased selection of construction materials, with Pfaudler glassed steel and alloy columns.

When inquiring check CP 4622 on handy form, pgs. 2-3

Industry wipes out corrosion with Firestone Exon Resins

Corrosion's on the way out at American Viscose ...QUELCOR* coating does the trick!

A mixture of entrained sulphuric acid, carbon disulphide, and hydrogen sulphide was eating away fume ducts at the world's largest rayon tire cord plant at Front Royal, Va. Maintenance costs piled up as protective coatings failed.

The answer was found in Avisco's Fredericksburg plant where heavy duty Quelcor coatings had stopped the ravages of similar corrosives for over a year. This is another example of the successful protection provided by this PVC Plastisol throughout the cellophane, rayon and staple fibre industry.

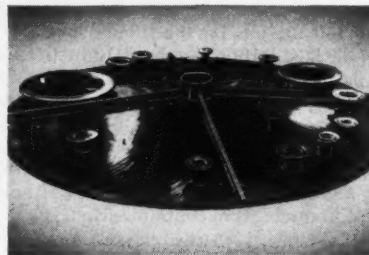


★ Hoods, ducts and blowers of General Electric's Philadelphia plating plant were being destroyed by many corrosives. Quelcor was applied with minimum loss in production time and stopped corrosion dead. The problem of sensitivity of plating solutions was eliminated.

*Quelcor is a product of Quelcor Inc., Chester, Pa.



★ Acid fumes have yet to corrode these Quelcor-coated deBothezat exhaust fans at American Enka's Lowland, Tenn. plant. Application to these blowers typifies the successful use of Quelcor by many industries faced with corrosion.



★ Lead-lined chemical reactor heads were no match for the solutions used by General Chemical's Baker & Adamson Works at Marcus Hook, Pa. Since coated with Quelcor, the units have shown no sign of corrosion.

Corrosion is being wiped out in plant after plant, all over America. From Firestone research come materials that help make this possible. Quelcor, for example, based on Exon 654 Resin, is a dip-coat application that forms a tough, seamless, non-porous film from 1/32" to 3/16" thick with fine abrasion and chemical resistance.

Other versatile Exon polyvinyl chloride resins are the basis for a broad range of corrosion-resistant materials which can be lightweight structural rigids, linings, or coatings. Each has distinctive properties to match your specific corrosion problem.

For details that will interest you in particular, call or write:

CHEMICAL SALES DIVISION

FIRESTONE PLASTICS COMPANY, DEPT. 8J, POTTSTOWN, PENNSYLVANIA
A Division of The Firestone Tire & Rubber Company

Firestone



Note: Firestone supplies the resin only, does not manufacture the end product.

When inquiring check CP 4623 on handy form, pgs. 2-3

CORROSION CONTROL

Carbon-filled phenolic cement resists salts, most acids, wide range of solvents . . .

material also withstands deteriorating effect of high temperatures

Uses: As mortar with bricks in tank linings and for laying of brick and tile floors and similar use in chemical processing areas.

Features: Cement shows excellent resistance to chemical attack by practically all salts, most acids, and a wide range of solvents. Material also has the ability to resist the deteriorating effect of high temperature use. Service involving temperatures as high as 360°F may be considered for brick lining applications. Cement is easy to use.

Description: Carbon-filled phenolic cement, designated Haveg 4310, is supplied as two separately packaged components. The first of these components is the liquid resin, a somewhat viscous but free flowing fluid. Second component, the powder, consists of carbon particles with which a setting agent has been admixed.

At time of use liquid resin is added to powder and two are thoroughly blended. The setting agent has been chosen so that a wide latitude is possible in the proportioning of the liquid resin to powder mixture. It is possible to provide quite fluid or relatively dry mixtures, and still have assurance of full working life and complete final set of cement.

Cement has been developed to permit a working life, in the troweling stage, of approximately one hour at 70°F, with hardening of the cement in six to eight hours. Under normal conditions equipment is ready for use within twenty-four hours after the work is complete.

Physical Properties

Density (lb/cu in)	0.055
Powder-resin ratio	1.7/1.0
Working life (min)	60
Tensile strength (at 7 days age) psi	1206
Bond strength, (psi) ASTM Tentative	
Test Procedure	207
Loss in weight after 12 days in boiling water (%)	0.10

(Corrosion-resistant cement is a product of Haveg Corporation, Sub. of Continental-Diamond Fibre Co., Dept. CP, Newark, Delaware . . . or for more information check CP 4624, pages 2 and 3.)

Trying to cut corrosion costs? . . .

Your guide to corrosion-resistant products and materials is the handy Product Directory on pages 170 to 173. All subjects discussed in this issue of CHEMICAL PROCESSING are listed there.

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CORROSION CONTROL

**Fume-tight, sanitary faucet
has Kel-F sealing rings
to resist corrosion . . .**

steam sterilization permitted without damage

Uses: In the chemical, food, or beverage fields faucet is interchangeable with company's Universal line of hot and cold liquid dispensers.

Features: Unit is corrosion-resistant and fume-tight. Use of chemically-inert Kel-F sealing rings permits steam sterilization and other special cleaning operations without risk of damage. Sanitary design includes elimination of residual trap areas, to further insure against contamination.



For hot or cold liquid dispensing

Description: Sanitary faucet is available in stainless steel and triple chromium-plated brass, with heat-resistant molded plastic handle. Positive shut-off is assured either by automatic closing or, with simple adjustment, by manual operation.

Unit is designed for removal, cleaning, part interchange, and assembly in a matter of minutes, without special tools.

(Sanitary faucet is a product of Economy Faucet Co., Dept. CP, 12 New York Ave., Newark 1, N.J. . . . check CP 4625 on handy form, pages 2 & 3.)

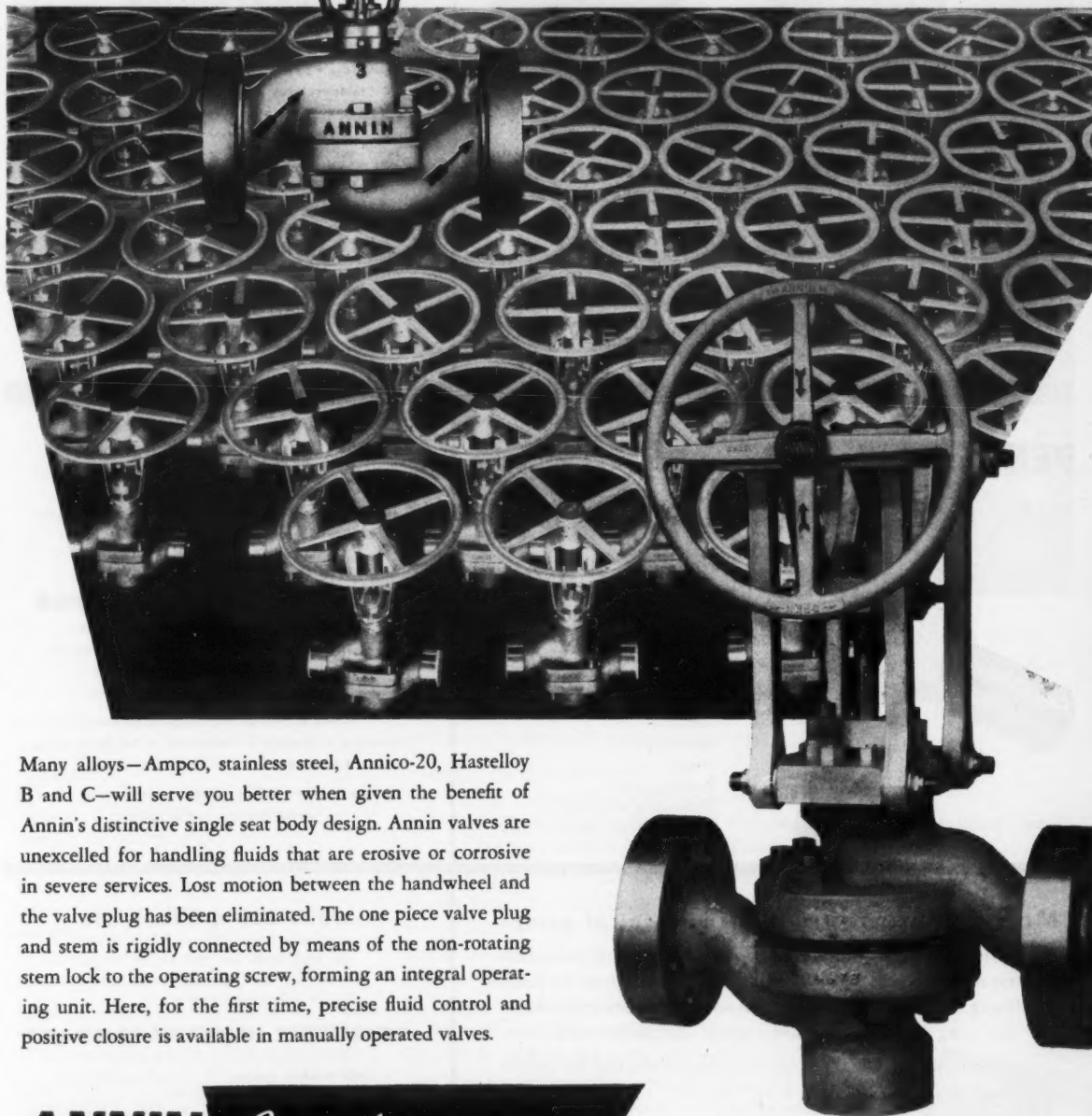
Shows fabricated applications of structural plastics

Three structural plastics designed for resistance to acid fumes and other corrosives are discussed in four-page bulletin. Actual fabricated applications of a glass-reinforced plastic, a rigid vinyl plastic, and a plastic of polyethylene are illustrated. Suggested uses for the materials are included.

Bul 1053 is available from Heil Process Equipment Corp., Dept. CP, 12901 Elmwood Ave., Cleveland 11, Ohio. Specify CP 4626, pgs. 2-3

THE VALVE *with more than 9 lives!*

**THE FINER ALLOYS PLUS OUTSTANDING
DESIGN MAKE ANNIN VALVES LAST LONGER**



Many alloys—Ampco, stainless steel, Annico-20, Hastelloy B and C—will serve you better when given the benefit of Annin's distinctive single seat body design. Annin valves are unexcelled for handling fluids that are erosive or corrosive in severe services. Lost motion between the handwheel and the valve plug has been eliminated. The one piece valve plug and stem is rigidly connected by means of the non-rotating stem lock to the operating screw, forming an integral operating unit. Here, for the first time, precise fluid control and positive closure is available in manually operated valves.

ANNIN *Control VALVES*

**AND AUTOMATIC VALVES in
or pressures to 30,000 psi**

THE ANNIN COMPANY

6570 EAST TELEGRAPH ROAD, LOS ANGELES 22, CALIF.

When inquiring check CP 4627 on handy form, pgs. 2-3

SIMPLIFY

HANDLING OF CORROSIVE CHEMICALS

PENBERTHY USCOLITE* EJECTORS



HYDRAULIC OPERATED FOR...

Liquid Transfer
Mixing and Blending
Pumping fluids with solids in
suspensions or in slurries
Pumping Gases
Gas or Vapor Removal
Aerating Liquids

PROPERTIES

Rigid • Tough • Lightweight • Non-toxic
Non-contaminating • Excellent chemical resistance
Inertness • Low thermal conductivity • Operation
temperatures up to 170° F • High safety
factor • Withstands abuse and severe service
• Physicals superior to most plastics.

TYPICAL APPLICATIONS

Chemical processing • Pharmaceuticals
Water Softening (Zeolite & others) • Plating • Textile
dyeing and finishing • Mixing and blending
beverages • Tanning • Bleach manufacture • Paper
industry • Electro chemicals...and other
processes involving the handling of corrosive
liquids or gases.

PENBERTHY STAINLESS STEEL "RATED JET" EJECTORS



STEAM, AIR, LIQUID OPERATED FOR...

Liquid Transfer
Heating
Circulating
Aerating
Agitating
Mixing
Pumping gases
Exhausting air or vapor
against high vacuum

PROPERTIES

Corrosion resistance of any type of
stainless is combined in a simple design of sound
principle to provide extended service under
corrosive conditions.

TYPICAL APPLICATIONS

Handling corrosive liquid or gas where
color, taste or odor are important: Chemical
Dairy • Food • Textile • Beverage
Sterilizer...and similar applications.

Where corrosion resistance is essential:
Chemical • Sewage • Petroleum • Textile • Water
treatment...and similar applications.

At temperatures where plastics, metals and other
materials are not suitable.

Many advantages over mechanical pumps

Consider the economy of low initial cost with practically
no maintenance...no moving parts, no lubrication, no pack-
ing glands. Expect and get noiseless, trouble-free operation
for long operating periods under corrosive conditions.

Penberthy offers many sizes and types of ejectors for imme-
diate shipment from stock or "tailored" to your particular
application.

WRITE FOR CATALOG 512

detailing the complete line or ask
our engineers for specific informa-
tion. You will find Penberthy Injec-
tors worth investigating.

PENBERTHY INJECTOR COMPANY

Division of the Buffalo-Eclipse Corporation
1242 Holden Avenue • Detroit 2, Michigan
Established 1866



- CYCLING JET PUMPS
- EJECTORS
- INJECTORS
- ELECTRIC SUMP PUMPS
- EDUCTORS
- EXHAUSTERS
- SYPHONS

There's Certain satisfaction in **PRODUCTS BY**

CORROSION CONTROL

**Rotary pump can be run dry,
impeller lubricates itself...**

carbon-graphite part can handle a variety of
corrosives, non-lubricating fluids

Uses: For chemical pumping operations, water
systems, and marine use, where gearless, rotary
displacement pump is applicable.

Features: Unit has a carbon-graphite impeller
which is self-lubricating. Carbon-graphite is inert
in water, oils, solvents, and a variety of non-
lubricating and corrosive fluids. Dry runs caused
by fluid cutoffs will not harm pump.

(In December CHEMICAL PROCESSING, page 69, it
was implied in the sub-heading that Teflon pump
impellers can run dry. It should have read, as was
stated in the story, that the Teflon impeller can
handle dry and non-lubricating fluids. It was also
stated in the same story that plastic bearings provide
self-lubrication for dry starch. Starch should, of
course, have read starts.

Description: Pump with carbon-graphite im-
peller is available in capacities from 1 to 10 gpm
with pressures to 150 psi. Housings are available
in bronze, synthetic rubber, and Hastelloy C.

(Corrosion-resistant pumps are products of Eco
Engineering Co., Dept. CP, 12 New York Ave.,
Newark 1, N. J. . . . check CP 4629, pages 2 & 3.)

Low-cost outfit permits repair and re-touch of plated parts "in-place"

Uses: Re-touch and repair work on plated
equipment and parts, and as an original permanent
electroplating process.

Features: Brush electroplating kit provides a
low-cost, efficient method of applying silver or
other metal deposits . . . only where brush appli-
cator is used. Power unit and solutions may be
used anywhere, permitting "in-place" electroplat-
ing. Thus, savings are realized in less downtime.

As an example, two large chemical companies, one
in Cleveland and the other in Michigan, use the
brush electroplater to replate buss bars and other
equipment pitted by corrosive vapors, without
dismantling.

Description: Brush electroplating kit consists
of a power unit, anodes, cleaning and preparation
solutions, plating solution and brushes. Plating
solutions and anodes are available for a variety of
metals. Three power units are 110-120v, AC 50-60
cy; 110-120v AC 25 cy; 220v AC 25 or 60 cy.

(Brush electroplating kit is a development of
Ajax-Consolidated Co., Dept. CP, 4615 W. 20th
St., Chicago 50, Ill. . . . check CP 4630, pgs. 2 & 3.)

When inquiring check CP 4628 on handy form, pgs. 2-3

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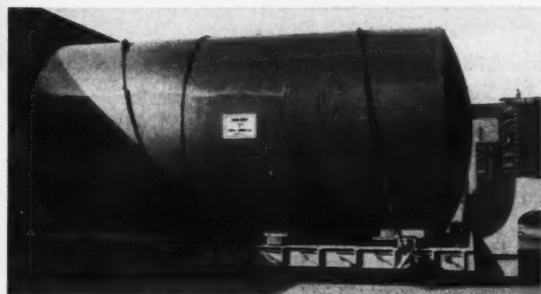
When inq

"RUBBERHIDE" Controls Corrosion and Abrasion OF METAL PRODUCTS, PARTS AND PLANT EQUIPMENT...



Corrosion or abrasion can't get a foothold after "RUBBERHIDE" Linings have been processed to the exterior or interior surfaces of metal objects, regardless of their size, shape or service requirements... from thumb screws to 20,000 gallon tanks. Compounded from rubber or neoprene to provide proper resistance to the specific corrosive agents involved, or to combat abrasive wear, these modern Linings invariably repay many times their cost through extended life of the products, parts or equipment to which they have been applied.

"RUBBERHIDE" Linings are processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location". Whether factory or field processed, you can rely on "RUBBERHIDE" Linings for effective, long-lasting protection.



Write for Booklet, or Contact Our Nearest Branch for Details.



GOODALL RUBBER COMPANY

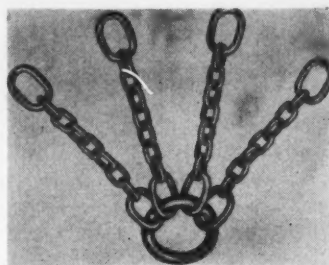
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches: Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul
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Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities
Est. 1870

When inquiring check CP 4631 on handy form, pgs. 2-3

CORROSION CONTROL

**Monel metal chain sling
reduces danger in lifting
containers of corrosives**

Parts of containers under hot or corrosive conditions can be handled with less danger by use of Monel metal chain sling. One use of the sling is for lifting baskets of parts in and out of pickling tanks, degreasing solutions, or acid baths.



Bottom ends of the four chains on sling can be equipped with various sizes and shapes of retaining rings or with hooks.

(Monel chain sling is product of Stanwood Corp., Dept. CP, 4819 W. Cortland St., Chicago 39, Ill. ... check CP 4632, pgs. 2 & 3.)

Ceramic coatings for nuclear reactors

To meet demands for high-temperature protection of alloys in nuclear reactors, the NBS has developed a ceramic coating material of extremely low thermal neutron absorption coefficient. Material is a result of investigation of over 200 ceramic coating mixtures.

Most promising of materials investigated are boron-free coatings of the frit-refractory type in which a high-barium frit is combined with ceria-chromic oxides. Tests indicate that these coatings satisfactorily withstand temperatures in excess of 1000°C found in nuclear reactors. Computed neutron absorption coefficients are in the range of 0.15 to 0.50 barns.

(Information courtesy of National Bureau of Standards, US Dept. of Commerce, Washington 25, D.C.)

New... FreeFlow GASKETS made of TEFLON*

JOHN CRANE



FOR EVERY CORROSIVE SERVICE

"John Crane's" FreeFlow construction and chemically inert Teflon have been combined as the answer for gaskets in corrosive service. This new construction assures a flush fitting with the I.D. of the pipe and the inner wall of the Teflon envelope, not possible with the ordinary "wishbone" type gasket. (See drawing above).

This means elimination of:

1. Flow restriction and turbulence in the line.
2. Danger of rupture at high temperature due to entrapped air between gasket insert and Teflon envelope.

"John Crane" Teflon FreeFlow gaskets are impervious to practically every known chemical or gas and are unaffected by temperatures from -100° to +482°F., depending on the insert material. They are available in all shapes and sizes for a wide variety of applications, such as glass lined, porcelain, pyrex and similar equipment, including reactor kettles and pipes, distillation columns and nozzles.

Request full information on "John Crane" FreeFlow gaskets for your particular requirement. Ask for our informative booklet, *The Best in Teflon*, for other important technical and application data. Crane Packing Company, 1821 Cuyler Avenue, Chicago 13, Illinois. In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N., Hamilton, Ont.

DEPEND ON "JOHN CRANE" TEFLON PRODUCTS

*DuPont trademark

JOHN CRANE

CRANE PACKING COMPANY

38 YEARS
INDUSTRIAL PROGRESS

When inquiring check CP 4633 on handy form, pgs. 2-3

CORROSION CONTROL

Electrolytic attack overcome by substituting external exchangers for internal . . .

proper materials help resist chemical attack of plating, anodizing, pickling solutions

Corrosion has always been a major problem in heating and cooling plating, anodizing, and pickling solutions. This corrosion is of two types, one electrolytic and the other chemical. Electrolytic attack can be overcome by substituting external heat exchangers for internal coils. Chemical attack is resisted by use of proper materials. These materials make possible the use of external exchangers in applications heretofore limited by materials of construction.

For example, carbon-loaded furfural plastic pumps have shown excellent life in all acid solutions except chromic and nitric. For chromic acid and the cyanides, cast steel (not cast iron) has proven excellent; for nitric acid and fluoride chrome, a high nickel chrome stainless steel designated as #20 is indicated. For exchanger tubes, impervious graphite (Karbate, etc) is excellent for all acid solutions except chromic and nitric. Seamless drawn steel is satisfactory for chromic acid and the cyanides. Stainless steel tubes are satisfactory for nitric. Tantalum is indicated for the fluoride chrome plating solution designated high speed. Substantial cooling capacity is required for many plating, anodizing, and pickling processes. Materials mentioned are not affected by thermal shock, hence can be used for alternate heating and cooling. This eliminates need for separate units to handle heating and cooling—both jobs can be done by one exchanger.

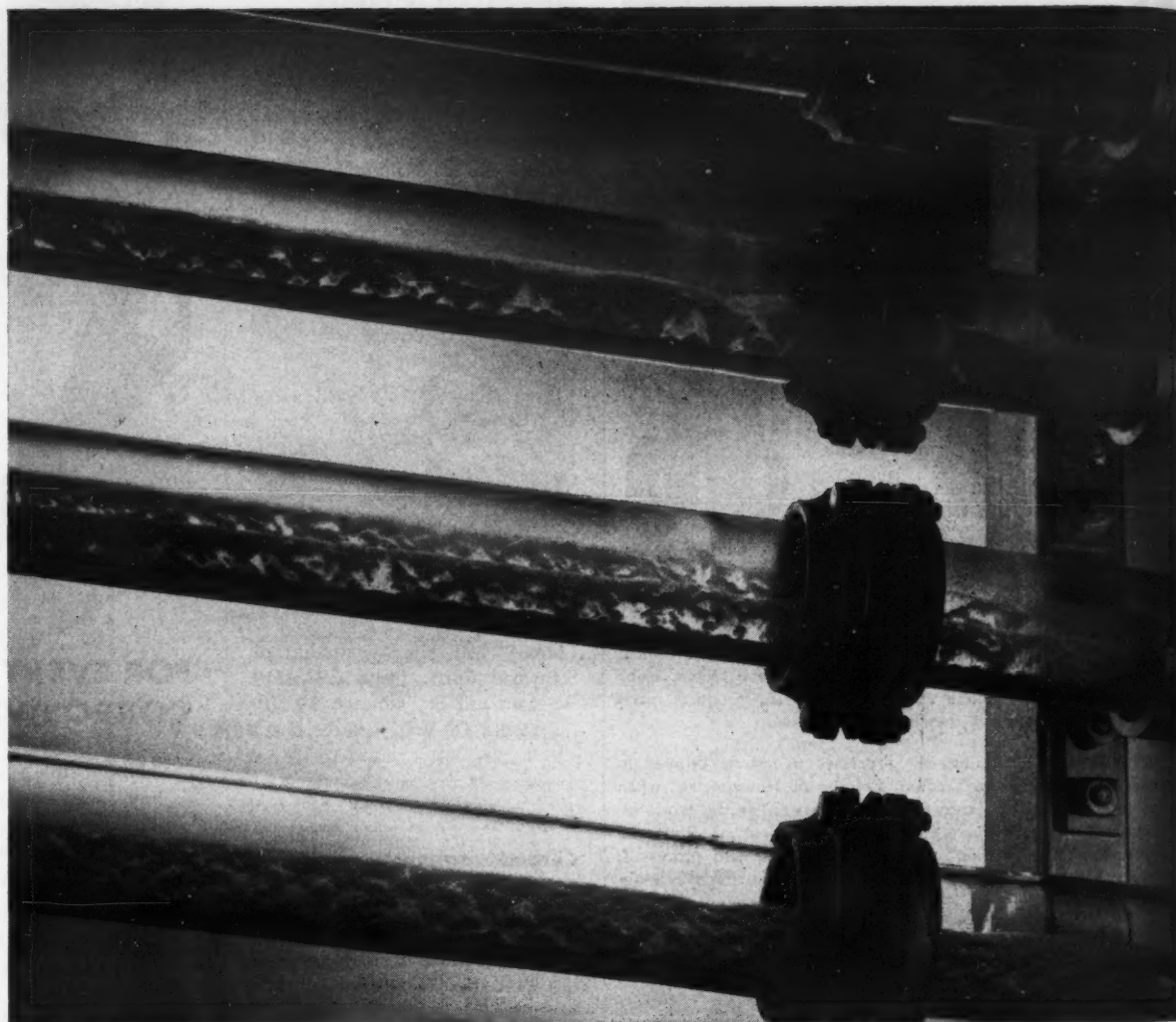
In some processes refrigeration is necessary to dissipate heat generated by electric input. Units are available combining compressors, condensers, solution pump, exchangers, and cooling towers. They eliminate chilled water or brine systems by directly expanding Freon in the solution exchanger jackets.

(Camac external heat exchangers are products of Carl Buck and Associates, Dept. CP, PO Box 267, Essex Falls, New Jersey . . . or for more information reader may simply check CP 4634 on the convenient Reader Service slip which is located between pages 2 and 3.)

Sulfuric, hydrochloric, phosphoric resisted by silicon carbide in many applications . . .

inertness, resistance to abrasion and cracking shown in plant installations

Inertness and abrasion resistance of silicon carbide refractories under moderate to high temperatures has led to their application for the same purposes at lower temperatures down to atmospheric. These properties are reinforced by good mechanical strength



You'll find that PYREX pipe does a superior job with such acids as sulphuric, hydrochloric, nitric, and acetic; and with such materials as chlorinated hydrocarbons, hydrogen peroxide, bromine, brines, and low-concentration alkaline solutions.

MORE INFORMATION FOR YOU

Space doesn't permit us to describe in detail all the advantages of using PYREX pipe—its clear transparency (you're almost certain to find this a great convenience); how you can plumb it in your own plant to meet any layout requirements; its relatively light weight; comparative costs. So let us send you any or all of the bulletins listed in the coupon on the opposite page.

You need only fill out the coupon and mail it to us for prompt action. Or, if you prefer to discuss your own specific problem immediately with one of our representatives, write, wire, or phone us, or our nearest distributor.

Are you missing the

DISTRIBUTOR LIST:

BELMONT, CALIFORNIA Glass Engineering Laboratories	ALBANY 5, NEW YORK A. J. Eckert Ind. Sales Corp.
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corrosion resistance of PYREX® pipe

because you think it will break?

LOOK what one plant manager says. "There was no breakage during installation. There have been no lines broken because of the product handled, the temperatures involved, or the age of the pipe. There has been no accidental breakage. In short—there has been *no breakage*."

Every "product" line in this plant has been PYREX pipe since 1943. The company switched to PYREX pipe because metal lines were quickly corroded by the acids in the products handled. Corrosion in the metal piping also made cleaning difficult, and the frequent replacements made maintenance very costly.

Thousands of engineers and operating men in hundreds of plants across the country have had the same experience with millions of feet of PYREX brand glass piping. If you are not enjoying the trouble-free corrosion resistance of PYREX pipe, because you are worried about breakage, why not talk to some of the people who are using it daily. We will be delighted to furnish you with the names of companies near you.

You can install it easily

More than 75% of the PYREX pipe now in use has been installed by our customers' own pipefitters. Proper installation is a relatively simple matter; you can plumb it in your

own plant to meet any layout requirements. It is easier to hang than many other kinds of corrosion resistant pipe, as there are no special hard-to-catch-on-to tricks about it. Our installation manual covering every detail is yours for the asking. And remember, once your PYREX pipe is in place, you can count on it for a lifetime of service.

Why PYREX pipe today is more durable than ever

The greatest strain on any type of pipeline is usually set up at the joints due to misalignment or lack of flexibility. To offset any such strain, all PYREX pipe ends and fittings (except U-bends) are now tempered, which makes them up to four times stronger than previous fittings. In fact, we know of instances where the metal bolts have been accidentally tightened to their breaking point without the glass yielding. Alignment of lines is also easier now because of improved gasketing materials, inserts and a complete line of spacers and adjustable joints.

Maintenance problems can be reduced

The liquid smooth surface of PYREX pipe does not pit. Deposits do not build up, so your product lines keep up to planned volume. Cleaning is simple, when necessary, as you can

RECOMMENDED WORKING PRESSURES—TEMPERATURES			
Pipe Size	Maximum Recommended Working Pressure	Maximum Sudden Temperature Differential	Maximum Operating Temperature
1"	50 p.s.i.	200° F.	450° F.
1½"	50 p.s.i.	200° F.	450° F.
2"	50 p.s.i.	200° F.	450° F.
3"	50 p.s.i.	200° F.	450° F.
4"	35 p.s.i.	175° F.	450° F.
6"	20 p.s.i.	160° F.	450° F.

see the interior of the pipe at all times. Most users find their pipeline maintenance problems are reduced to a periodic inspection of joints and occasional tightening of flange bolts. One plant superintendent said, "Since PYREX pipe was installed for all of our product lines, maintenance has been practically nil."

What does it cost?

Initial cost of PYREX pipe compares favorably with most other corrosion resistant piping . . . and it is less expensive than some. Subtracting low installation cost, economical maintenance and long-time service from initial cost puts PYREX pipe on the profit side of your plant budget instead of the cost-of-operating side.

STANDARD SIZES PYREX BRAND GLASS PIPE				
I.D., Inch	O.D., Inch	Mean Wall Thick., Inch	Stock Lengths (Feet)	Approx. Weights Lbs./Ft.
1"	1¼"	½"	½ to 10	0.6
1½"	1¾"	¾"	½ to 10	1.0
2"	2½"	1¼"	½ to 10	1.3
3"	3½"	1¾"	½ to 10	2.0
4"	4½"	2¼"	½ to 10	3.4
6"	6½"	3¼"	½ to 10	6.3

and high resistance to cracking from thermal shock. Such properties have resulted in a variety of uses for these refractories in the chemical process industries.

For example, in a plant handling hot, wet SO₂ gas, alloy steel spray nozzles corroded in about two months, whereas silicon carbide nozzles continue in service after five years. Related applications find these refractories in use in burning oleum sludge and in processes where corrosiveness of SO₂ gas at temps to 1800°F must be resisted.

In muriatic acid furnaces of the Mannheim type, use of silicon carbide domes is widespread. A more recent development, however, is the use of this material to protect the plows in the furnace by fitting properly shaped tile over the metal, thus improving plow life. In a similar application, silicon carbide tile is used to protect plows of a multiple hearth furnace decomposing ferric chloride with steam to produce hydrogen chloride.

In still another application, silicon carbide's high thermal conductivity has proved valuable in the manufacture of hydrogen chloride by combustion of chlorine and hydrogen. As in the case of Mannheim furnaces, hydrogen chloride does not corrode silicon carbide, even at elevated temperatures.

There are several instances of silicon carbide tubes being used to carry hot combustion products from an oil or gas burner into liquids for evaporation. Phosphoric acid solutions are successfully concentrated in this way, with the gases bubbling from underneath the submerged open end of the tube.

Similar installations involve these tubes carrying burning gases vertically downward and then horizontally. Gases escape through a series of holes in the horizontal tube and bubble upward through liquid. A number of corrosive solutions are so treated successfully as long as appreciable percentages of hydrofluoric acid are not present. This acid is destructive to the siliceous bond generally employed with silicon carbide refractories.

(For more information on silicon carbide refractories contact Dept. S73, Refractories Div., The Carborundum Co., Dept. CP, Perth Amboy, N.J. . . or check CP 4636 on handy form, pages 2 and 3.)



CORNING GLASS WORKS, CORNING, N. Y.

Corning means research in Glass

CORNING GLASS WORKS, 31 Crystal St., Corning, N. Y.

Please send me the bulletins checked below:

- ☐ EA-1: "PYREX Pipe in the Process Industries" (Illustrated case histories)
- ☐ EA-3: "PYREX brand 'Double-Tough' Glass Pipe and Fittings Catalog"
- ☐ PE-3: "Installation Manual for PYREX Pipe"
- ☐ Please have your representative call on me.

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

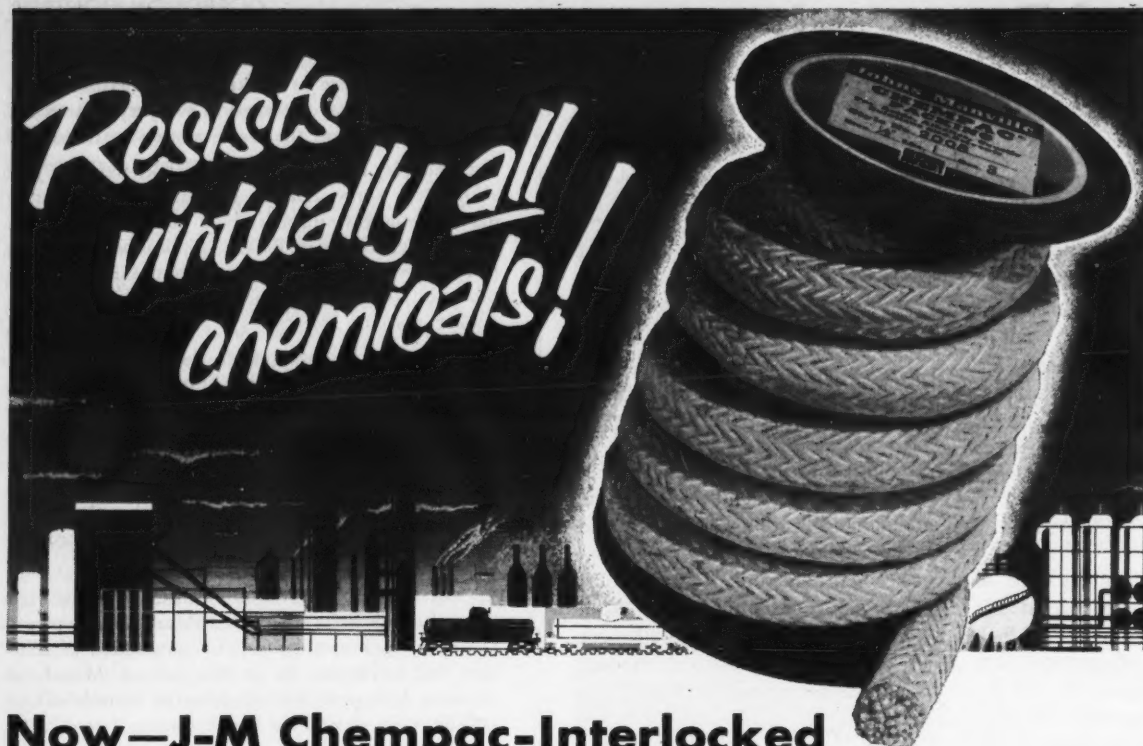
Rubber and bitumin combined to make resistant paint

Combination of chlorinated natural rubber and bitumin together with modifiers and appropriate solvents produces black corrosion-resistant paint described in six-page folder. Applications and advantages of this product and different formulations for corrosion-resistant service are discussed.

Bulletin on Rubalt "RA" Black Paint is issued by Alfred Hague & Co., Dept. CP, 227 34th St., Brooklyn 32, N. Y. Check CP 4637, pages 2 & 3.

When inquiring check CP 4635 on handy form, pgs. 2-3

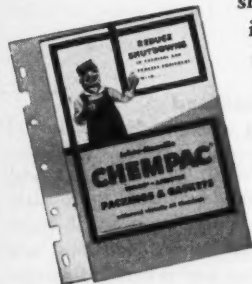
*Resists
virtually all
chemicals!*



Now—J-M Chempac-Interlocked Packing combines both "Teflon" and asbestos protection

Johns-Manville now introduces Chempac®-Interlocked Packing, with three important advantages for service in chemical and process equipment. Interlocked provides the excellent sealing and heat resistant qualities of asbestos. It is braided by the unique and exclusive J-M method, so that the asbestos yarns are securely interlocked and cannot come apart in service. And it is treated with chemically inert Teflon*, which is almost universally resistant to chemical and solvent action.

Chempac-Interlocked can be used to pack pump rods or shafts, rotary filters, mixers and similar apparatus handling strong acids, alkalis, caustic solutions and many other reagents at temperatures to 500F.



Johns-Manville PACKINGS & GASKETS

When inquiring check CP 4638 on handy form, pgs. 2-3

Other J-M Chempac Packings and Gaskets for the Chemical and process industries

J-M Chempac Packings in coil, spiral and ring form. Made of asbestos, treated with Teflon, they are available in types for caustic, acid, chlorine and solvent service.

J-M Chempac Gaskets with Asbestos-Teflon base. They have high mechanical strength and heat resistance, with excellent sealability at low bolt stresses.

J-M Chempac Folded Gaskets designed for glass lined equipment. Asbestos-Teflon base gives them high sealing effectiveness against a wide range of chemicals.

J-M Chempac Spirotallic Flange Gaskets for perfect sealing in high temperature and pressure service, constructed of interlocked plies of metal and Teflon-Asbestos.

*Trade Mark of DuPont Tetrafluoroethylene resin

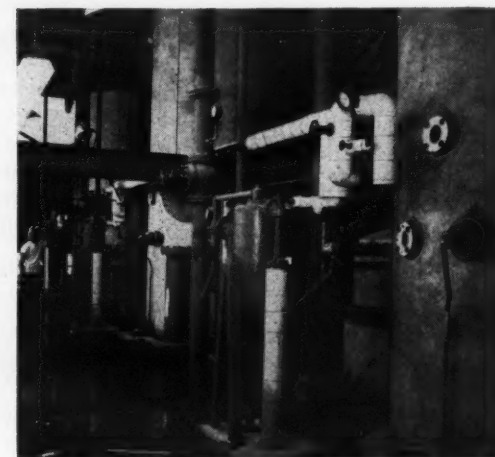
CORROSION CONTROL

Rubber lining and Karbate tubes protect units concentrating phosphoric acid . . .

39% P_2O_5 is fed to three parallel single-effect evaporators at Davison Chemical

To stave off the corrosive effects inherent in the continuous handling of phosphoric acid, exposed parts of three single-effect vacuum evaporators in use at Davison Chemical's Bartow, Florida plant, are rubber lined. Corrosion-resisting Karbate tubes are used to connect the top and bottom chambers of the heating elements. At this plant, the continuous concentration of phosphoric acid is accomplished by the Dorrco Strong Acid Process.

During the process, phosphoric acid is delivered to three parallel thickeners in the evaporation system. Each of these units is in closed circuit with an evaporator, and serves as a blending tank. Acid effluent of evaporators with a strength of 41% P_2O_5 is returned to thickeners where it is diluted by the 32% feed acid. Ratios are such that the average concentration in the thickeners is 39% P_2O_5 . The bulk of this 39% acid is recirculated to evaporators and remainder is transferred to storage thickeners.

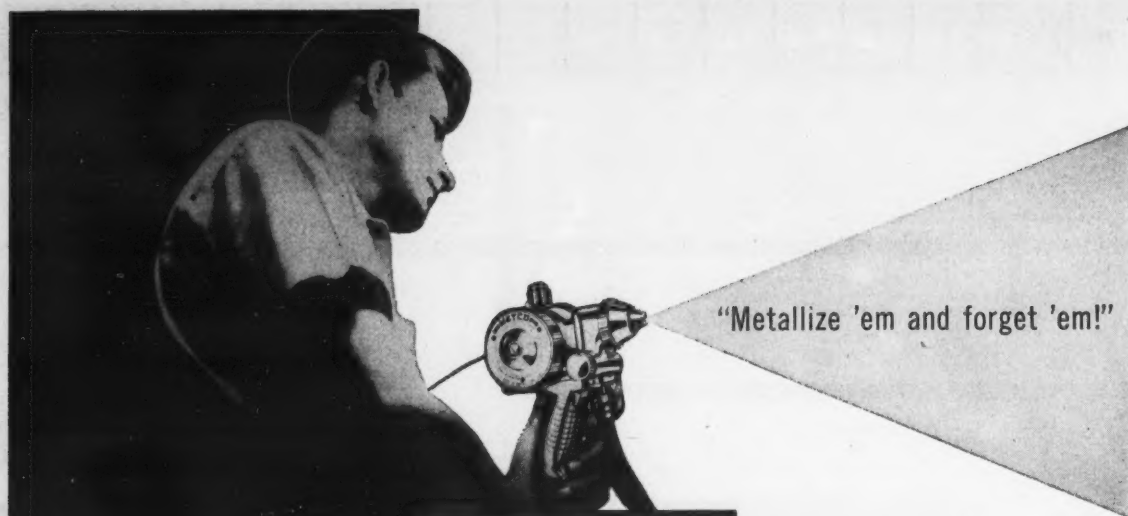


Evaporation section of strong acid process at Davison

Each evaporator has the capacity to evaporate 5100 lb of water an hour when concentrating phosphoric acid from 39 to 41%. Feed rate is 104,200 lb/hr of 39% acid at 55°C.

This, then, is the corrosive against which the rubber lining on all exposed parts of each system, including the thickeners, provides protection. The 350 Karbate tubes used in each heating element are a further safeguard for the continuous processing necessary to produce triple superphosphate. Each system is boiled out at least once a week with a soda solution.

(Evaporators used in process are products of Swenson Evaporator Co., Dept. CP, 15613 Lathrop Ave., Harvey, Ill. . . . check CP 4639, pages 2 and 3.)



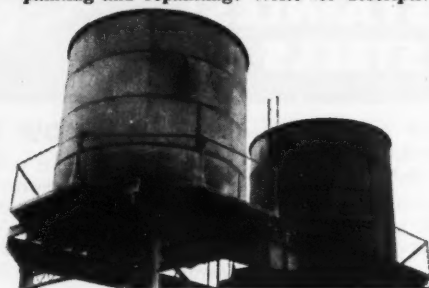
**Want
to forget
about
rust for
20 years?**

Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without any further maintenance.

In the chemical field, metallized zinc and aluminum, used with special organic aftercoatings, have proved highly resistant to many corrosives—eliminate undesirable product contamination.

These unique metallic coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 93-X—it's free.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

here are 11 Metco System contractors

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco System specifications. For further information, or copy of descriptive bulletin, contact the Metco System Dept. in the one nearest you.

Metco System contractors					
Baltimore 30, Maryland THE SOUTHERN GALVANIZING CO., INC. 1616 Bush Street Tel. Gilmer 7711	New Orleans 13, Louisiana GULF ENGINEERING CO., INC. 1000 South Peters Street Tel. Canal 4421	Costa Mesa, California CLARK METALLIZING, INC. 636 West 17th Street Tel. Beacon 5527	Barberton, Ohio AKRON SAND BLAST CO. 50 E. Springfield Rd. Tel. Plaza 3412	Buffalo 1, N. Y. METAL-CLADDING, INC. Lakeview & Porter Avenues Tel. Elmwood 9536	
Lincoln Park 25 (Detroit), Mich. DIX ENGINEERING CO., INC. 1417 Dix Road Tel. Dunkirk 1-9822	Philadelphia 29, Pa. NW PROTECTIVE COATINGS DIV. OF METALWELD, INC. Scotts Lane & Abbottsford Ave. Tel. Victor 8-1810	Chicago 8, Illinois CHICAGO METALLIZING CORP. 2506 West 18th Street Tel. Rockwell 2-2600	St. Louis 10, Missouri ST. LOUIS METALLIZING COMPANY 625 South Sarah Street Tel. Jefferson 1-5253	Houston, Texas F. W. GARTNER CO. 3805 Lamar Avenue Tel. Alwood 5338	Brooklyn, N. Y. ARTHUR TICKLE ENGINEERING WORKS, INC. 21 Delevan Street Tel. Main 5-4200

When inquiring check CP 4643 on handy form, pgs. 2-3

CORROSION CONTROL

NiF_2 , FeF_2 in fused salt mixtures cause leaching of chromium from structural metals

Inconel metal was found to be most resistant of all structural metals tested against corrosive action of fused salt mixtures of Na, Li, Be, K, and Zr fluorides. Structural metals were studied in the development of a pumping system for high temperature operation with large temperature gradients and high flow velocities, such as encountered in nuclear reactor coolants, moderators, and fuel carriers.

Investigation method was first to find the most resistant structural metal, then to evaluate other factors in order to minimize corrosive action on that metal.

Conclusions made relative to reducing corrosion of Inconel by fused halide salts are:

- 1) Removing NiF_2 , FeF_2 , and HF impurities from fused salt before using, reduces the attack.
- 2) Corrosion is minimized by removing oxide film on container materials.
- 3) Corrosion is decreased by adding zirconium hydride or an alkaline metal to the salts. This reduced the NiF_2 , FeF_2 , and HF which tend to form. Per cent addition of ZrH_2 is in vicinity of 0.5.

Tests were made in a thermal convection loop of metal pipe. A 1500°F temperature was maintained on the hot leg and 1300-1350°F on the cold leg, with tests lasting 500 hr. Flow velocities of fused salts were 2-6 fpm. At end of run, salts were allowed to freeze in place and sections of piping removed for metallographic examination and analysis.

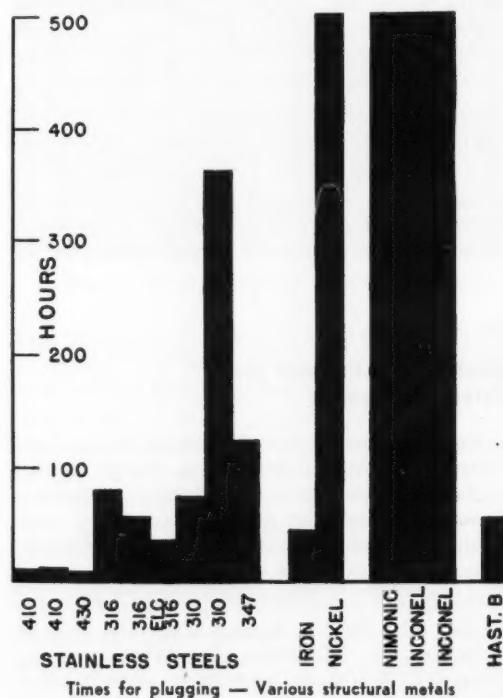


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tion

Chart shows number of hours loops made of various structural metals operated before plugging. Nickel and nickel-based alloys operated for the full 500 hr. The 300 and 400 series stainless steels exhibited flow stoppage due to collection of K_2NaCrF_6 in the cold zone. Inconel seemed to be the best material.

Impurities of NiF_2 , FeF_2 , HF affected corrosion rate and chromium leaching. Depth of attack was found to be approximately constant between 1350° and 1650°F. Effect of ratio of structural metal surface to volume of salt on the depth of attack shows that corrosion increased as the ratio decreased. Rate of corrosion rose rapidly for first 250 hr of tests, then dropped off. Initial attack is mainly due to reduction of impurities; second (slower) stage is caused by mass transfer of chromium from hot leg to cold leg.

Effect of leaching was highest in the hot leg wall. Here chromium was leached to a depth of 25 mils. Voids were visible on metallographic examination and did not interconnect to surface. Majority of holes were in grain boundaries and were found to grow in size with increasing time or temperature.

(Condensed from technical paper, "Corrosion Behavior of High Temperature Structural Metals in Fused Salts," by G. M. Adamson, R. S. Crouse, and W. D. Manly, Oak Ridge National Laboratory, Carbide & Carbon Chemicals Co., Dept. CP, P.O. Box P, Oak Ridge, Tenn. Paper was delivered at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

Strong oxidizing agents won't affect liner of pump

For handling strong oxidizing agents, company's Flex-I-Liner pump utilizes a molded flexible liner of DuPont Hypalon, an elastomer chemically known as chlorosulfonated polyethylene. In addition to excellent chemical resistance to such strong oxidants as chromic, nitric, and sulfuric acids, chlorine dioxide, sodium hypochlorite, sodium dichromate, and pickling solutions, liner offers good flex life and abrasion resistance.

Rigid body block of pump, which moves material by "squeegee" action, lends itself to corrosion resistant materials of construction such as polyethylene, non-plasticized PVC, Buna N, Bakelite, and stainless steel. Liner itself may be used for continuous elevated temperature service to 260°F.

Pumps with Hypalon liners are available in capacities from fractional to 20 gpm with a discharge pressure range from zero to 50 psi. Suction lifts up to 24" Hg are obtained with all standard units.

(Corrosion-resistant pumps are products of Vanton Pump and Equipment Corp., Dept. CP, Empire State Bldg., New York 1, N.Y. . . . or for more information check CP 4644 on handy form, pages 2 and 3.)



AMPCO* METAL

... the special alloys that make
good where other metals fail

HERE are some of the properties of Ampco Metal that help you keep production up, costs down:

- Excellent resistance to corrosion in certain media.
- High tensile and compressive strength.
- Unusual resistance to wear from abrasion, erosion, and cavitation pitting.
- High physicals at extreme temperatures.
- High rate of heat transfer.
- High impact and fatigue values.

Because it combines all of these qualities, Ampco Metal is often called The Metal Without an Equal.

No matter what you do — whether you work in the chemical or process industries, refine oil, run a steel mill, make stampings, generate power, or any of hundreds of other jobs, you can make Ampco Metal work for you. It saves operating headaches and pro-

duction grief, because it often makes good where other metals fail.

These versatile special alloys fight wear, corrosion, impact, fatigue; give long life and dependable performance under the severest conditions. That's why they are widely used in such tough assignments as fractionating towers, exchanger components, slippers and screw-down nuts for blooming mill service, aircraft parts, dies, valves, bushings, and other punishing jobs.

Chances are Ampco Metal can help you, too. It's available in sand and centrifugal castings, sheets, plates, bars, tubes, extrusions, welding wire and electrodes. Consult your nearby Ampco field engineer or write us for full information.

*Reg. U. S. Pat. Off.



AMPCO METAL, INC.

Dept. CP-1 • Milwaukee 46, Wisconsin
West Coast Plant, Burbank, California

Ampco Metal, Inc.
Dept. CP-1 • Milwaukee 46, Wisconsin

I am interested in learning more about the properties and uses of Ampco Metal in the process industries. Please send me literature.

Name.....Title.....

Company.....

Company Address.....

City.....(.....) State.....

PR-16

When inquiring check CP 4645 on handy form, pgs. 2-3

HEAT EXCHANGERS

for
CORROSIVE
and
NONCORROSIVE
LIQUIDS
and
GASES



Industrial
**tailored
units**

Whether for laboratory or pilot-plant requirements or large-quantity processing, it will pay you to look into the INDUSTRIAL tailored units for heating or cooling liquids or gases. Rather than adaptations of standard units, INDUSTRIAL heat exchangers are engineered and built to individual performance specifications. Depending on size and other operating conditions, the INDUSTRIAL heat exchanger may be a large single- or multiple-pass tube-bundle type or a series, parallel, or series-parallel combination of individual single- or multiple-tube units. In any type unit, thermal shock and the requirements of the corrosive or noncorrosive fluid on the tube or shell side determine the materials of construction. Thus, each INDUSTRIAL tailored heat exchanger embodies the ultimate in operating performance and efficiency at lower initial and maintenance costs.

Get INDUSTRIAL'S recommendations for your next heat transfer equipment.

INDUSTRIAL
FILTER & PUMP MFG. CO.

5908 Ogden Avenue • Chicago 50, Illinois

When inquiring check CP 4646 on handy form, pgs. 2-3



This Bulletin describes the INDUSTRIAL service on heat transfer equipment.

Ask for Bulletin 600-2.

PRESSURE FILTERS
DEMINERALIZERS
RUBBER LININGS
HEAT EXCHANGERS
CENTRIFUGAL PUMPS

5009

CORROSION CONTROL

Filled-Teflon material
withstands temps
-100 to 400°F...

plastic is available in rod,
tube, other shapes

Uses: Developed originally as a bearing material, plastic also finds use as gaskets, valve packing, seals, bellows, etc., especially in high-temperature and corrosion-resistant applications.

Features: As a bearing material, plastic needs no lubrication. It has a low coefficient of friction, excellent resistance to abrasion and chemical corrosion. In addition, this filled-Teflon withstands temperatures in the range -100 to 400°F.

Description: Filled-Teflon material, called Rulon, is basically one of several grades of Teflon combined with metal or mineral fillers in varying percentages and different sizes of flakes or granules. Fillers used range from aluminum and Monel to asbestos and mica.

Beside its availability as a bearing material, filled-Teflon comes as rods, tube, and cross-sectional shapes to any length.

(Filled-Teflon material is a product of Dixon Corporation, Dept. CP, PO Box Drawer 7, Bristol, R.I. . . . or for more information check CP 4647, pages 2 and 3.)

Silicone rubber O-rings coated with Kel-F for solvents . . .

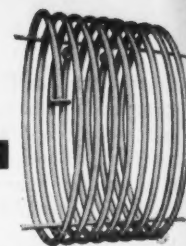
low temperature properties are retained

Kel-F coated silicone rubber O-rings are particularly useful where resistance is needed to aromatic, chlorinated, or other solvents. Although chemical resistance is increased by coating, low temperature properties of silicone rubber are not lost. Useful temp range is -120 to +390°F.

(For further information on O-rings contact Bacon Industries, Inc., Dept. CP, 192 Pleasant St., Watertown, Mass. Check CP 4648, pgs. 2 & 3.)

How to S-T-R-E-T-C-H

Coil Life in H₂SO₄



... and other strong corrosives

... Switch to *Carpenter Stainless No. 20 Cb!*

• Service life was DOUBLED . . . maintenance costs reduced to almost zero by making 7-foot coils for dyestuff process out of this super corrosion-resistant stainless.

Carpenter Stainless No. 20 Cb offers extraordinary resistance to H₂SO₄ in various concentrations, and free sulphate ions, at temperatures up to boiling. It is completely resistant to a long list of other strong corrosives such as arsenic, benzoic, carbonic, citric, picric, and mixed acids; acid-zinc solutions, and acetate solvents.

Send for FREE TEST SAMPLES to compare No. 20 Cb with other materials in your conditions. Ask for bulletin containing corrosion resistance, properties, performance results, applications, and fabricating data. For quick information on tubing, pipe, sheet and plate of Stainless No. 20 Cb, write, phone or wire . . .

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, New Jersey

When inquiring check CP 4649 on handy form, pgs. 2-3

where **HEAT** eats metal
paint with **THERMALITE**
and protect up to **1000°**

**NEW SILICONE HIGH-HEAT ALUMINUM
PAINT FUSES TO METAL . . . PROTECTS
AGAINST RUST AND CORROSION**

A revolutionary paint development, Thermalite fuses to metal, will not discolor, blister, burn or flake off—even at 1000° heat! Protects against rust, corrosion, chemical fumes. Formulated to stand severe weather exposure as well as high heat.

Ordinary aluminum paints flake off under high heat because the resins burn out. Thermalite's film-forming solids consist of "silicones"—the wonder resin that defies heat, fuses to metal, producing a tough, silver-bright, tightly-adhering coating.

In hundreds of applications industrial users have proved that Thermalite solves their problem of obtaining a paint coating that withstands 400° to 1000° heat. Two types available, one for interior, the other for exterior metal surfaces.

FREE! . . . to industrial paint users. Your letter-head request brings complete information on Thermalite for interior or exterior use. Write today!

TROPICAL PAINT COMPANY SINCE 1883
1128-1296 W. 70th Street, Cleveland 2, Ohio

When inquiring check CP 4650 on handy form, pgs. 2-3

CHEMICAL PROCESSING

CORROSION CONTROL

Double-seal ball construction permits valve materials same as pipe . . .

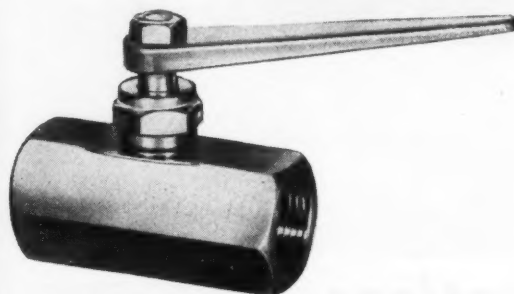
eliminates possibility of valve failure due to electrolytic action, corrosion

Uses: Handling liquids and gases including those that are corrosive or abrasive.

Features: Double-seal ball principle makes possible production of valves in almost any metal or alloy, with seats and packings in Buna-N, neoprene, silicone, Teflon and Kel-F.

Thus, valves are readily available in same material as pipe itself. This eliminates electrolytic action and corrosion which commonly result in valve failure.

Description: Double-seal ball valve permits full, non-turbulent flow of media. Positive shut-off is maintained under vacuum and even under extreme abrasive



Valve requires little maintenance, no lubrication

and corrosive surface conditions at 300 and 600 psi. Valve opening and closure is effected through 1/4 turn of lever handle.

Maintenance is held to a minimum, and no lubrication is required. Valve stem may be removed for repacking while valve remains in line, eliminating shut-down time. Available sizes are from 1/4 to 2".

(Double-seal ball valve is a product of Jamesbury Corp., Dept. CP, 15 Union St., Worcester 8, Mass. . . . or check CP 4651 on form, pages 2 and 3.)

How to reduce corrosion in piping systems

Recommendations to help reduce rate and severity of corrosion in wrought iron piping systems are included in 32-page bulletin. Sections of publication are devoted to a round-up of wrought iron pipe installations, and a review of piping properties essential to long service life.

"Piping for Permanence" may be obtained on letterhead request to Engineering Service Department, A. M. Byers Company, Dept. CP, Clark Bldg., Pittsburgh, Pa.



Wherever corrosive fumes are exhausted,

SPECIFY THE COMPLETE NEW LINE OF
ACIDPROOF, ALL-METAL DURCO

exhaust fans

When you know that fumes to be exhausted are corrosive, why install anything less than a fan which will handle them *permanently*? Newly designed DURCO exhaust fans are all metal—Duriron casing with Durimet 20 multi-blade rotor—for complete corrosion resistance. They're 30% lighter than previous models. They're lower priced and save the cost of down-time and labor for repair or replacement. We'll send full facts in Bulletin F/1.

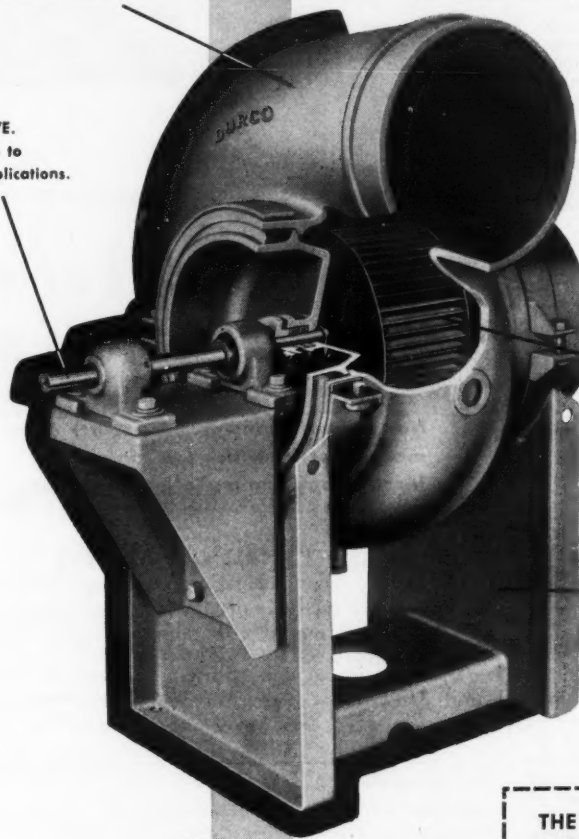
DURIRON CASING.
All metal sections for complete corrosion resistance.

BELT DRIVE.
Adaptable to varied applications.

8 STANDARD DISCHARGE ARRANGEMENTS.
Also available for angular discharge.

DURIMET 20 MULTI-BLADE ROTOR.
High corrosion resistance and capacity increase of over 50%.

FABRICATED STEEL BASE
Weight reduction with greatest strength.



Mail coupon for Bulletin F/1



THE DURIRON COMPANY, Inc.
408 North Findlay St., Dayton, Ohio
Please send Bulletin F/1 on DURCO B-124 Fans.

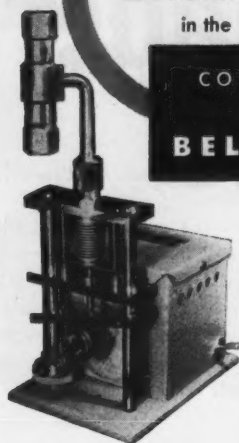
NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

When inquiring check CP 4652 on handy form, pgs. 2-3

HOW Contamination Is Prevented

in the

CORSON-CERVENY MICRO- BELLOWS PUMP



All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds. The use of accurately machined cone-taper fittings makes this feature possible.

For this reason, the pump will not contaminate material that it is handling, and is adaptable for many specialized laboratory uses.

For full information about construction, capacity, performance, write for copy of Pump Booklet.

RESEARCH APPLIANCE COMPANY

Box 463, West View Road, Pittsburgh 9, Pa.

When inquiring check CP 4653 on handy form, pgs. 2-3



THE Quick Way TO ACCURATE VISCOSITY MEASUREMENT CONTROL STUDY

Yes, the new Brookfield booklet shown above contains the answers you've been looking for. Its 20 pages, packed full with the latest "how-to-do-it" information, could only have been prepared by the world's leading manufacturer of viscometers — are the condensation of 15 years of specialized work on all sorts of rheological problems. Send for your free copy today. No obligation of any kind, of course. Don't delay. Write Dept. B.

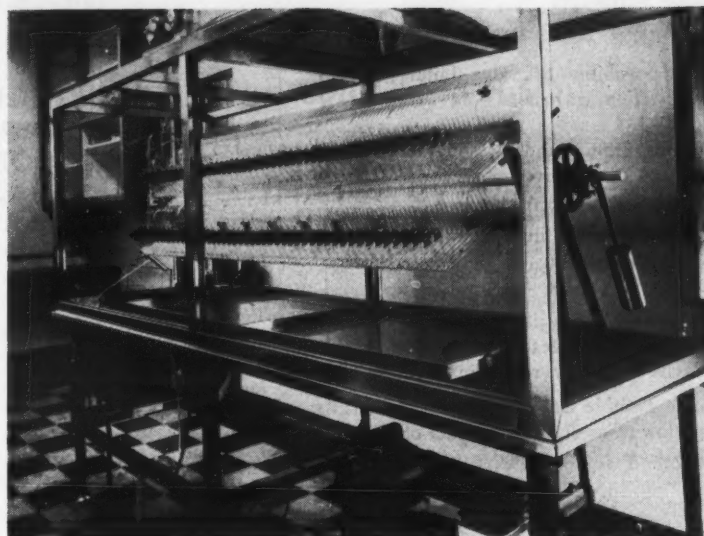
WITH A
Brookfield
SYNCHRO-ELECTRIC
VISCOMETER

BROOKFIELD ENGINEERING LABORATORIES, INC.

280 Cushing Street, Stoughton, Mass.

When inquiring check CP 4654 on handy form, pgs. 2-3

for the laboratory



Countercurrent distribution apparatus has 200 equilibration cells

Automatic liquid-liquid repetitive extraction can . . .

achieve otherwise "impossible" separations

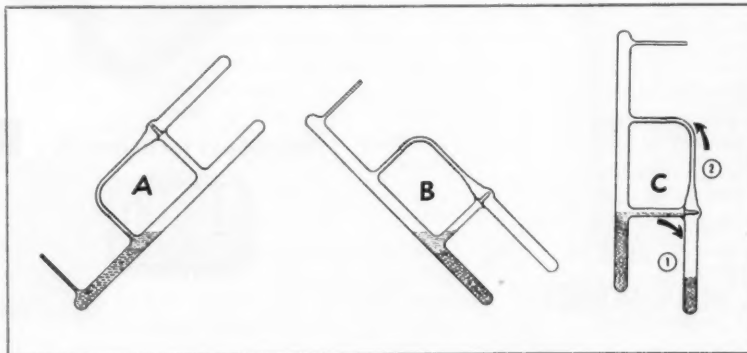
No manual transfer of extract need be made in setup which can run sample through any number of equilibration stages

Uses: For separation and characterization of complex mixtures of closely-related compounds by countercurrent distribution (multiple extraction) method.

Features: Apparatus eliminates labor involved

in application of high number of manual transfers. It permits many equilibration stages (depending on length of extraction train) to be used on material to be separated. Thus, a reproducible fractionation of high efficiency is obtained. Equilibration train of any length may be obtained by joining cells. Separation of organic compounds is accomplished without use of heat which might cause temperature degradation of labile molecules. Extraction can be made near 0°C.

Description: Extraction train consists of equili-



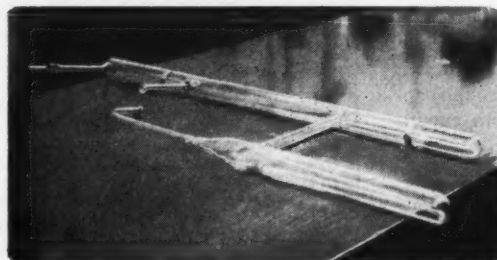
Two phases in equilibration cell are brought to equilibrium by rocking cells from A to B. Each position is about 40° from horizontal. After predetermined number of strokes, depending on rate at which equilibrium is established, phases are permitted to separate at position B. Upon tilting to position C, upper phase decants into portion of tube (1). When cell is tilted back to A, contents in 1 flows through tube (2) into next adjoining cell of series

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bration cells (up to 1000 if desired) joined glass-to-glass. Compound under investigation, with a suitable solvent system, is placed in instrument as lower phase. One or more cells receive sample, depending on solubility and size of the instrument. All other cells are filled to their capacity with lower phase. Upper phase is introduced automatically (or manually) into cell #0. Two phases in equilibration cell are brought to equilibrium by rocking motion, supplied by hand in smaller models, or by driving mechanism in large units.

After predetermined number of strokes, depending on rate at which equilibrium is established, phases are permitted to separate when apparatus is tilted back. When unit is further tilted until cells are in vertical position, upper phase material is decanted, then transferred to next cell. Equilibration, settling, and decantation strokes are continued until material has passed through train.



Extraction train may be made of any number of these cells joined with glass-to-glass connections



Closeup of filling funnel and equilibration cells shows clamp method of joining glass-to-glass connections

Following complete run through apparatus, distribution pattern can be established for purpose of sorting mixture into groups, each containing solutes with similar partition ratios. Solute in each tube is plotted against consecutive tube number.

Instruments are constructed in various models, differing in number of cells employed, total volume of each cell, relationship in volume of phases, features such as one or two rows of cells. In a one-row instrument, upper phase travels from left to right. In a two-row instrument, upper phase travels

(Continued on next page)

Microscopic "Snowflakes" of silica . . .

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*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.



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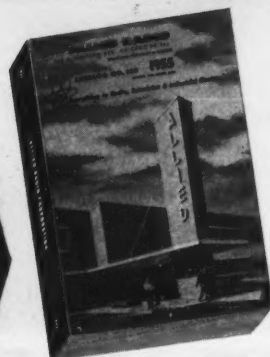
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FOR THE LABORATORY

(Continued from preceding page)

from left to right in upper row, entering lower row at extreme right. In lower row, cells are so constructed that upper phase travels from right to left. On reaching extreme left, sample can either be withdrawn, or automatically re-enter upper row traveling again from left to right, thus closing the circle. This is an important technical feature. Performance parallels that of a fractionating column. This method is known as the recycling method.

Automatic fraction collector (optional equipment) can be set to collect effluent phases. Fractions are withdrawn and analyzed to determine highest concentration of desired compound. These fractions can then be recycled through apparatus until an extremely high purity sample is achieved.

Actual experiment on artificial mixture of ten amino acids has been made with apparatus. Unit of 220 equilibration cells operated until 780 transfers had been applied. System was made by equilibrating equal volume of 5% HCl with n-butyl alcohol. All bands were separated except phenylalanine, leucine, and isoleucine tripeptide. And this trio can be resolved by recycling through apparatus. "Withdrawn" curves agreed with experimental curve.

(Countercurrent distribution apparatus is a product of H. O. Post Scientific Instrument Co., Inc., Dept. CP, 6957-63rd Ave., Middle Village, N. Y. Check CP 4658 on handy form, pages 2 and 3.)

Furnishes inert atmosphere of dissociated ammonia for lab furnace . . .

atmospheres equal to commercial hydrogen are produced at 1/3 its cost

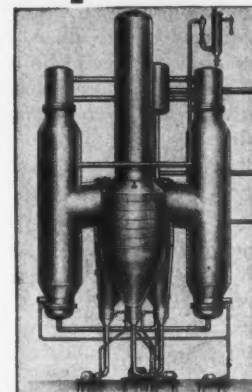
Uses: For bright annealing electric metals, bright annealing stainless steels, bright annealing or bright tempering of any ferrous or non-ferrous metal or alloy, bright copper or silver brazing, or sintering or reducing powder metals requiring a strong reducing atmosphere.

Features: Unit dissociates ammonia with 99.9% efficiency at 35 cfh. Atmospheres equivalent to commercial cylinder hydrogen are produced for approximately one-third its cost.

Description: Catalyst chamber has vertical inlet and outlet tubes designed to fit manufacturer's laboratory pot crucible furnace. Tubes are welded to cover plate of furnace to form complete gas tight unit. Pure nickel shot surround tubes within chamber.

Furnaces are brought to operating temp of 1900°F and held there by automatic controller to eliminate possibility of burning out elements in case of

45° to 100° Evaporation



THE Mojonnier Lo-Temp Evaporator provides evaporation as low as 45° F. and complete recovery of condensate. Present applications in the Chemical Process Industries include concentration of heat sensitive pharmaceuticals and antibiotics, low temperature fractionation and distillation of solutions, and distillation of flavor extracts and essences. In the Lo-Temp, high pressure ammonia gas is used as the heating medium, and low pressure ammonia is used to condense the vapors from the product. Advantages of this system are:

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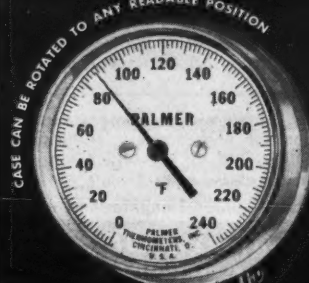
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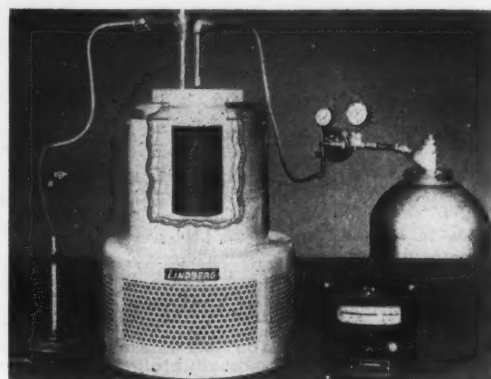
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JANUARY, 1955

FOR THE LABORATORY

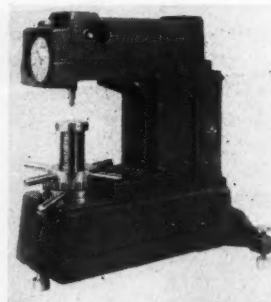


Dissociates ammonia with 99.9% efficiency at 35 cfh

shorts. Ammonia cylinder is cracked and pressure expansion valve adjusted to five pounds. Raw ammonia flows through catalyst chamber where it is cracked. Needle valve controls flow of dissociated gas to work. Flow is checked by flow meter and gas is directed to point of use. No air is used in dissociating process.

("Lab-Hyam" dissociated ammonia generator is a product of Laboratory Equipment Div., Lindberg Engineering Co., Dept. CP, 2450 W. Hubbard St., Chicago 12, Ill. . . or for more information check CP 4661 on handy form, pages 2 and 3.)

Both regular and superficial
hardness may be tested
on same instrument



Dual function hardness tester makes all regular Rockwell tests (60, 100 and 150 kg loads) and superficial tests (15, 30 and 45 kg loads) with any suitable standard "C", "N" or ball indenter. All results show on direct-reading dial gage. Major and minor loads are applied by dead weights. Stops inserted on sides of column facilitate changes in test loads. Elevating-screw handwheel, gage-setting bezel, load-tripping and load-lifting mechanism are located on front side of base.

plied by dead weights. Stops inserted on sides of column facilitate changes in test loads. Elevating-screw handwheel, gage-setting bezel, load-tripping and load-lifting mechanism are located on front side of base.

(Kentrall Hardness Testers are products of Torsion Balance Company, Dept. CP, Clifton, New Jersey . . . or for more information reader may simply check CP 4662 on the convenient Reader Service slip which is located between pages two and three.)

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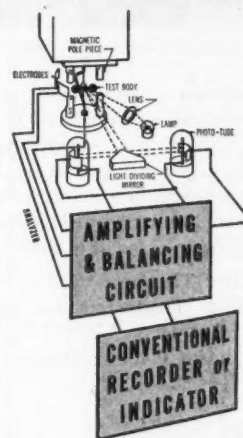
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When inquiring check CP 4663 on handy form, pgs. 2-3

NEWS from FILTERTOWN

A boon to the filtration of beer is the successful development by the E&D laboratories of a new, high wet strength filter paper that is 25 times stronger than most any filter paper ever known. Yet, it is sufficiently porous to permit the rapid filtration of as many as 150 barrels per hour. BREW-BRITE (registered name) effects tremendous savings in time and money. And the brewmasters are delighted with the "high polish" obtained that is so essential for today's modern beer . . . A new, disposable cigarette filter tip, using E&D filter paper, grade 613, is gaining popularity . . . Great publicity achieved by E&D's "no-rattle" paper grade 914, used by radio and TV announcers and actors, which eliminates the bothersome sounds made by ordinary paper . . .

T. J. Druding, sales manager, announces enthusiastic acceptance of Filtration Analysis Report, designed to help industry with solution of specific filtration problems. If you would like to determine if filter paper can be of help to you, and how it will work on your filter press, with the great savings that filter paper can show over any other filter media, write for a free copy of Filtration Analysis Report or for free samples of filter paper . . . Not generally known is the fact that E&D was established in 1890; that E&D pioneered in folded filter circles; and that it is the only company in America exclusively devoted to the making of filter papers for science and industry . . . Formula for savings:

Cost of filter paper in relation to cost of filtration is .0001 or less!



When inquiring check CP 4664 on handy form, pgs. 2-3

FOR THE LABORATORY

Automatically performs titrations faster, more accurately than hand method

Uses: Permits one operator to handle large numbers of titrations simultaneously, with smaller average time per titration and improvement in overall accuracy.

Features: Automatic titrimeter measures out required amount of titrant solutions and stops flow at exact endpoints. Instrument changes over easily for micro and Karl Fischer moisture determinations.

Description: Entire automatic section of instrument (one-tube amplifier, power supply, special burette, and polyethylene tubing) is offered separately and may be attached to manufacturer's manual titrimeter.



Chemist using three automatic titrimeters

Unit uses two sensitive electrodes which continuously transmit potential as titrant is added to sample. Control unit which received signal compares this value with pre-set one for reaction's true endpoint. When two values coincide, signal actuates solenoid and clamp closes on small-bore polyethylene tubing feeding titrant.

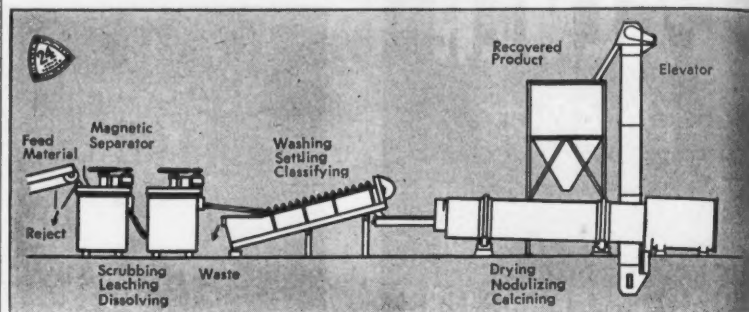
(Automatic Titrimeter and automatic attachment for manual Titrimeters are products of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. Check CP 4665 on handy form, pages 2 & 3.)

Describes laboratory apparatus

Illustrated four-page bulletin in two colors shows portable grinding mill, washability machine, cotton colorimeter, and inspection magnifier.

Newsletter No. 5 is issued by Gardner Laboratory Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. When inquiring specify CP 4666, pages 2 and 3.

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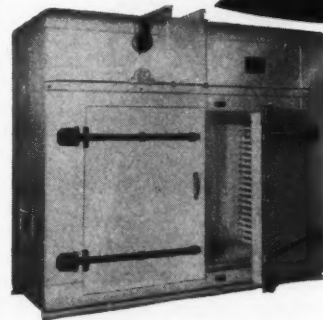
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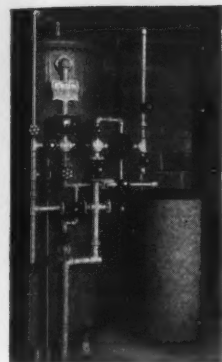
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Write for Bulletin 512

ZEOLITE WATER SOFTENERS

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When inquiring check CP 4669 on handy form, pgs. 2-3



What's A "New Solution"?

It's an article in **CHEMICAL PROCESSING** describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved. Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

LABORATORY

One-pan lab balance eliminates handling of weights

One-pan laboratory balance uses substitution weighing method. Built-in weights are on same end of beam as sample pan. Knobs on front of case operate all weights from 200 g to 100 mg. Total of weights is read directly from counters on front of case. Values from 100 mg to 0.1 mg are read on projected scale at right of counters.

Beam is stress-relieved, homogeneous aluminum alloy. All weights are made of high chrome-nickel alloy which is non-magnetic and extremely resistant to corrosion. Weights are within Class S tolerance.

(Right-A-Weigh balances are a product of Wm. Ainsworth & Son, Inc., Dept. CP, 2151 Lawrence St., Denver 2, Colo. Check CP 4670 on handy form, pages 2 and 3.)

Controls temps in range from -100 to 600°F

Uses: Industrial applications where exact temp control is necessary, without need for indicating or recording devices.

Features: Unit is flexible in types of control available, since motor or other final control element determine floating, proportioning, on-off, or two-position control.

Description: Controller, designated the 077, has range from -100 to 600°F, operates on the resistance thermometer principle. In addition to single-point model described above, the 077 is available in two-bulb cascade control model, with provision for changing effect of secondary bulb relative to primary.

Both feature sensitivity, speed of response, and accuracy.

(Temperature controller is a product of Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Aves., Philadelphia 44, Pa. . . or for more information check CP 4671, pages 2 and 3.)



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FOR THE LABORATORY

**Tube contents easily identified,
cotton plugs eliminated
with metal caps . . .**

lightweight, color caps fit all size tubes, are quickly put on and removed

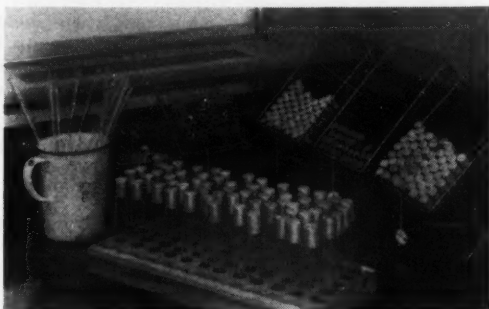
Uses: Aluminum caps protect contents of test tubes from contamination by dust and impurities in air. They also serve to identify contents of tube.

Features: Caps are available in natural aluminum or anodized red, blue, green or yellow.

Description: Made of sturdy, 1/32" thick lightweight aluminum, caps are 30 mm long and are made to any size ID. Usual specification is for caps 2 mm larger than OD of tubes. Caps



Tubes of all sizes are quickly and easily capped



Aluminum tube tops in use at Indiana State Board of Health in examination of colirom group of bacteria

can be subjected to high temperature for sterilization purposes.

(Caps are a product of the Lowell S. Fisher Co., Dept. CP, 32 East 45th St., Indianapolis 5, Ind. . . . or for more information check CP 4674 on handy form, pages 2 and 3.)

**Describes microscopes,
stereomicroscopes**

Bulletin of eight pages describes and illustrates inclined binocular, vertical monocular, and stereomicroscopes.

Bul is available from Burrell Corp., Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. When inquiring specify CP 4675 on handy form, pages 2 & 3.



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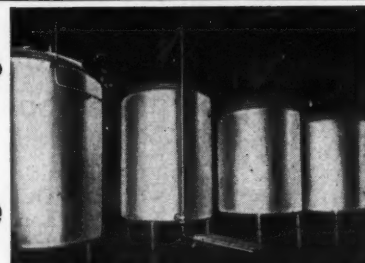
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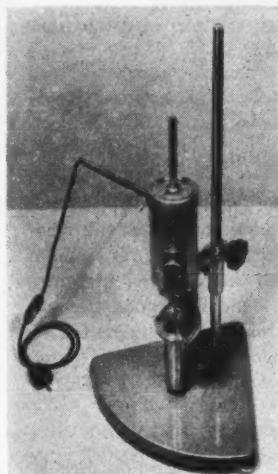
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CHEMICAL PROCESSING

FOR THE LABORATORY

**Instantly detects, records
viscosity changes
of samples . . .**

measurements are unaffected by friction in viscometer gearing



Viscometer has speeds of 20, 64 and 200 rpm

Uses: For rapid and accurate indication and recording of viscosity changes in laboratory samples.

Features: Pointer attached to motor housing indicates viscosity while unit is operating. Measurements are entirely unaffected by friction in gearing.

Description: Frictional forces, which are linearly related to viscosity, are transmitted through rotating measuring element

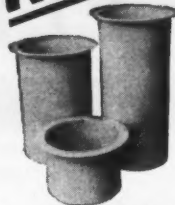
to rotatable-mounted motor. Torque of measuring element is opposed by constant modulus hairspring. Instrument has three speeds — 20, 64, and 200 rpm. (Drage Viscometer is distributed by Drage Products, Dept. CP, 406 32nd St., Union City, N.J. . . . or for more information check CP 4678 on handy form, pages 2 and 3.)



Looking for something?

Laboratory reagents, specialties, equipment are all listed in **CHEMICAL PROCESSING's** Product Directory. See pages 170 to 173 for page references.

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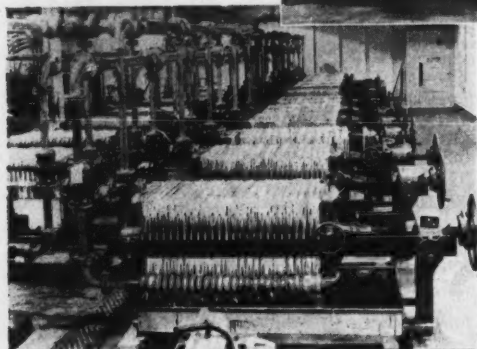
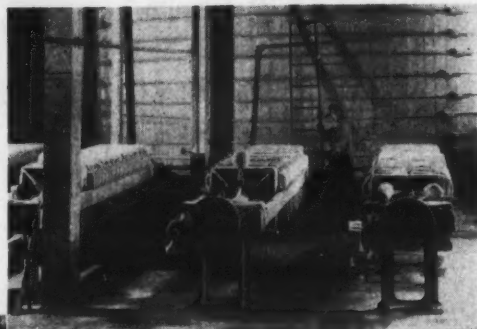


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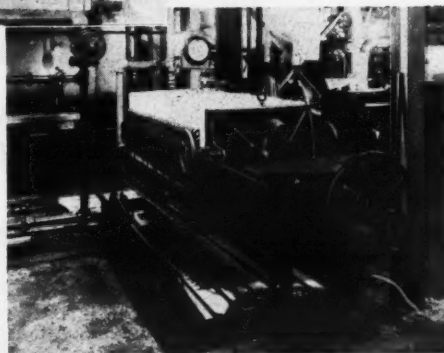
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JOBs for FILTER PRESSES that improve processing

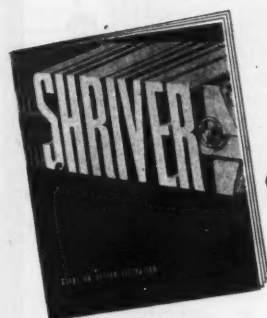
Recovery of firm filter cake free of soluble salts as in this Shriver installation for colors and pigments. The presses are equipped with individual outlet cocks for controlling flow of wash water to individual filter chambers.



Filtration of viscous materials as in this battery of Shriver filter presses for rayon, which permit using inexpensive, throw-away filter medium, reducing operating costs.



Filtration requiring high degree of clarity, as in the purification of edible oils in this Shriver filter press, where filter paper or pads are conveniently used.



There are many other applications where Shriver filter presses help the problem of cutting operating costs or improving product quality. The new issue of the Shriver Book gives you plenty of information, suggestions and aids. Get a copy... free.

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When inquiring check CP 4682 on handy form, pgs. 2-3

briefs

from contemporary publications

Synthetic detergents

This eight-paper symposium on synthetic detergents covers household and industrial uses, fatty alcohols, alkylbenzenes, sulfonated alkylates, sodium phosphates, and evaluation of detergent performance. ("Industrial and Engineering Chemistry," September, 1954, page 1913.)

Control of fans

Pros and cons of methods of fan control are illustrated with special stress on variable speed drives and control by vanes and dampers. Three pages, 8 figures. ("Power Engineering," September, 1954, page 82.)

Titanium alloys

This survey of titanium technology covers techniques for grinding, welding, machining, and fabricating titanium alloys. Physical properties are included. ("Mechanical Engineering," September, 1954, page 716.)

Quality control for platers

This paper presents the elements of statistical quality control for electroplaters. Histograms and fraction defective charts are illustrated. ("Metal Finishing," September, 1954, page 64.)

Blending fibers

From England comes a treatment of the blending of wool and synthetic fibers. Stages in blending, lubricating techniques, willowing, and methods of sheeting are highlighted. Three pages, 4 figures. ("Textile Recorder," September, 1954, page 78.)

Bleaching kraft pulp

For bleaching kraft pulp an hypochlorite stage followed by an acid post-treatment improves the bleach response of sodium peroxide. Bleached kraft with brightness values of about 85 and with good strength properties and stability of brightness can be attained. Nine pages, 16 tables, one figure. ("Tappi," September, 1954, page 376.)

Paper dyeing

The following aspects of the dyeing of paper are covered: methods, retention of color, kinds of dye, pigments, fastness, sizing, and special problems. In the paper industry the annual consumption of dyes and pigments are 14 and 10 million pounds. Four pages, 12 references. ("Paper Industry," September, 1954, page 589.)

Corrosion

From England comes a presentation of corrosion problems in the manufacture of phosphoric acid. Attention is given to pertinent metals, other mineral substances, wood, rubber, and synthetic resins. Five pages, 3 references. ("Industrial Chemist," August, 1954, page 369.)

Fuel-bed firing

U. S. Bureau of Mines reports that for fuel-bed firing of coal by crossfeed ignition, ignition rates continue to increase at feed rates of air between 500 and 1200 lb/sq ft/hr. These ignition rates are far higher than those of the usual grate burning methods, which are hindered by lifting fuel beds. Heat transfer equations are included. Eight pages, 2 tables, 7 figures. ("Combustion," September, 1954, page 66.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service for you . . .

Fluorocarbon moldings

Specially designed hot runners and the practice of bringing material to molding temperature result in improved quality of polychlorotrifluoroethylene parts. Narrow temperature ranges and mold types are discussed. Four pages, 7 references. ("Modern Plastics," October, 1954, page 125.)

Isotopes in industry

Through use of outlines and line cuts, this review of industrial isotopes deals with oil wells, paint, refractory brick, cutting tools, water lines, liquid levels, lubrication, and road building. Two pages, 14 figures (*Plant Engineering*, September, 1954, page 88.)

Radar gaging of rainfall

Sampling of rainfall by means of the Illinois Climatological network is supplemented with radar, which scans a large area and locates and measures the precipitation. Sixteen pages, one table, 10 figures, 10 references. ("Journal of the American Water Works Association," September, 1954, page 852.)

Flash aging of textiles

Proper choice of thickness and dyes permits aging times for textiles to be cut from 12 minutes to 30 seconds. Brighter colors are attained and less dye is required. The aspects of printing, padding, oxidizing, and washing are considered. Six pages, 4 photographs. ("Textile World," September, 1954, p. 82.)

Finned coils

Pressure drops and heat transfer coefficients are predicted from correlations based on studies of air flowing across banks of finned tubes. Four pages, 6 figures, 7 references. ("Petroleum Refiner," Sept. '54, p. 303.)

How to measure cellulose crystallinity

Changes in crystallinity of cotton cellulose that are caused by heat and chemical action can be detected by means of iodine absorption. Good agreement with results obtained through use of other methods is reported. Six pages, 8 tables, 19 references. ("Textile Research Journal," September, 1954, p. 822.)

Survey of styrene and polystyrene

From England come recent developments in styrene and polystyrene under headings of interpolymers, vacuum forming, copolymers, chemical resistance, and ion exchange resins. Two pages, one photograph. ("Rubber and Plastics Age," August, 1954, page 385.)

Fluoridation of water

Court actions, legislation, and legislative investigations figure in this survey of municipal fluoridation. Six pages, 3 tables, 5 references. ("Journal of the American Water Works Association," October 1954, p. 987.)

The system: Fe-Mn-S-O

Introduction of manganese in the system Fe-S-O, produces extensive changes in eutectics and regions of limited miscibility. Phase diagrams and photomicrographs are given. Thirteen pages, 3 tables, 15 figures, 18 references. ("Journal of Metals," September, 1954, page 957.)

Fluid chiller

This paper is concerned with the choice and use of direct expansion fluid chillers. Heat transfer, methods for control of flow, and balancing of the system are discussed. Six pages, 7 figures, one table. ("Refrigerating Engineering," August, 1954, page 60.)

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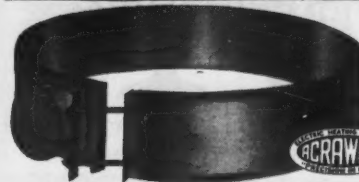
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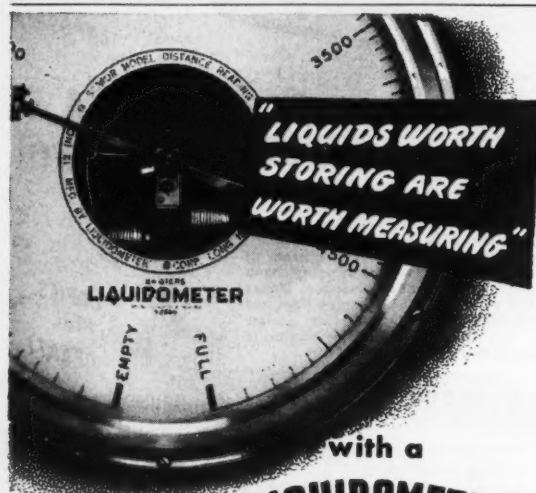
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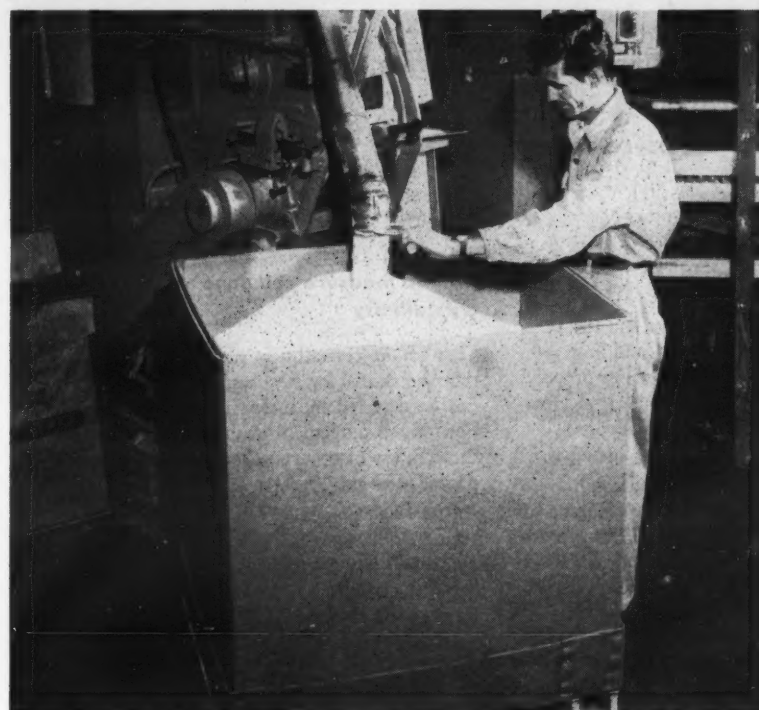
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When inquiring check CP 4685 on handy form, pgs. 2-3



At supplier's plant, pre-palletized carton is easily filled with styrene molding powder . . .

Bulk container, holding 1000-lb styrene molding powder,
brings benefits to plastic housewares manufacturer four ways —

saves
and
guards

handling man-hours
storage space

color uniformity
plastic purity

Expanding operations at the Bernard Edward Company in Chicago, manufacturers of plastic housewares, necessitated an easier method for in-plant handling of its molding powder, since space was limited. Having had some previous experience with large bulk boxes of molding powder, BECO sought further utilization of these containers as an answer to its problem. They requested one of their major suppliers, Monsanto Chemical Company, to ship part of its styrene powder requirements in 1000-lb bulk containers.

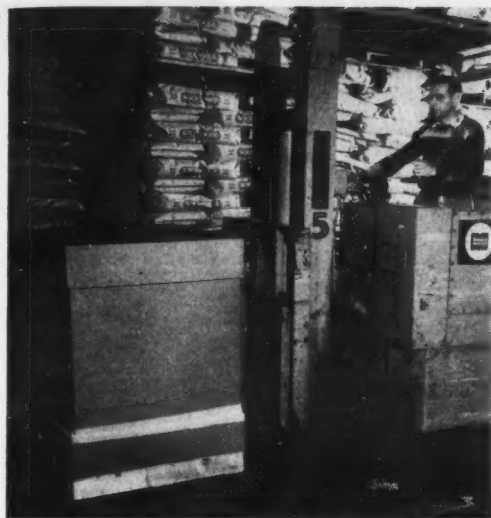
Shipments in these containers started arriving from Monsanto about 11 months ago. Immediately, it was found that these palletized containers saved man-hours in handling. Now one man can unload and store a truckload (20) of these containers in an hour. Previously, four men had been required for the one-hour job, unloading and storing bags or

Arriving at user's plant, carton is handled entirely by lift truck. When powder is needed, carton is placed near hopper or mixer, heavy-duty flap is opened, scored sheet slit and . . .



CHEMICAL PROCESSING

packaging



... strapped to pallet, and moved to storage prior to shipment

drums (same total weight.)

Savings in storage space were realized immediately, too. Space needed to store 40,000 lb of molding powder in 1000-lb containers is 83 sq ft less than that required by drums, three sq ft less than bags.

Added advantages accrued. From the carton in storage, molding powder goes either to a 1000-lb hopper (for sorting into 200-lb lots used in press room) or into a Cleveland mixer for coloring. In either case, a lift truck can deliver the carton to its destination where it is emptied directly into hopper or mixer. No powder is spilled or otherwise lost. This has assured a perfect color mix with each batch of powder, since it is always certain that 1000 lb of powder are dumped into mixer.

In addition, the design of the container, which permits it to be emptied much like a box of salt

(Continued on page 115)

... carton easily emptied after being lifted into position by truck

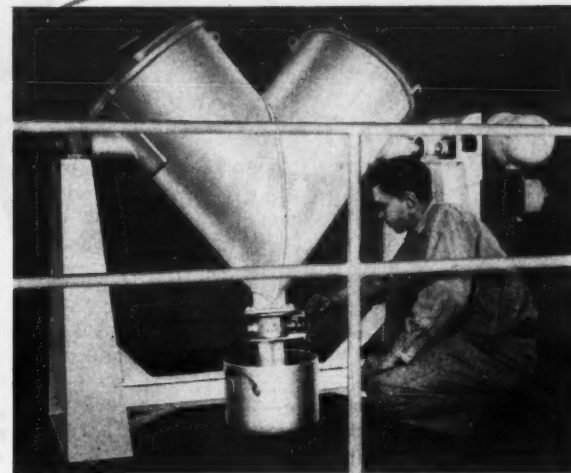
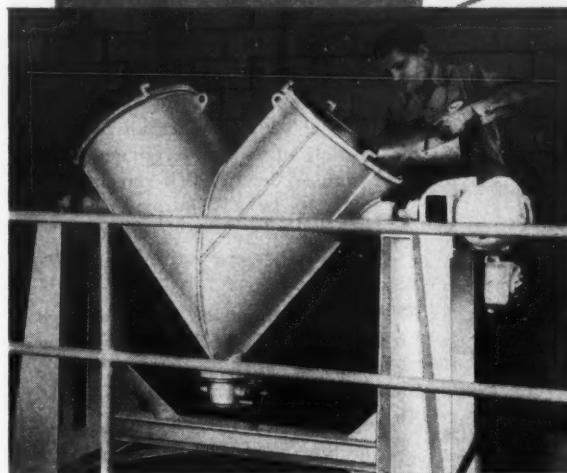


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B₁, B₂, Niacin and Iron

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For good health

For good blending



Delicious Cream of Rice is a family favorite.

Enriched with essential vitamins, it not only tastes good, but is good for you.

Thorough blending of vitamins is, of course, imperative. A **p-k** 5 cu. ft. stainless steel blender*, equipped with intensifier bar*, effectively blends four basic vitamins—niacin, thiamine, riboflavin and iron compound. This is another example where the food industry has selected the **p-k** twin shell blender to precision blend these important vitamins.

Loading is simplified by quick opening, dust-tight covers. Discharge is rapid, too,

* patented

with the pre-blended vitamins emptied directly into containers for subsequent blending with the rice. Its smooth baffle-free interior facilitates clinical cleaning.

The application of **p-k** twin shell dry blenders to your particular processes will assure efficient blending at low cost. Why not pre-test your materials in **p-k**'s special blending laboratory. Send a sample of your materials for a thorough blending analysis, or write for catalog 12, no obligation.



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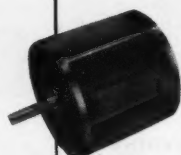
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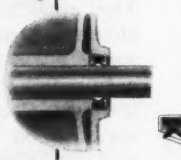
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When inquiring check CP 4687 on handy form, pgs. 2-3

PACKAGING

**Automatic net weigher
discharges load after
pre-set time . . .**

counter unit records number of weighments

Uses: Net weighing of all free-flowing materials.

Features: Unit is fed free-flowing commodity by a vibratory feeder until predetermined amount is in weigh bucket. Bucket will not discharge its contents until a pre-set time interval has elapsed.

Counter unit records number of weighments, and shuts off operation when a pre-set number of loads have been made. A push-button control panel also permits manual control when desired.

Description: Automatic net weighing machine, designated Model 920, provides visual indication of every weighment, and high accuracy which remains unaffected by any normal machine vibration. Scale is precision-built, with one-to-one ratio dynamically balanced lever.

Control rheostats provide infinite adjustment of both fast and slow rate of feed to weigh bucket, allowing high accuracy.

Unit capacities are available from a few ounces up to twenty-five pounds, with dial and beam calibrations in metric or avoirdupois.

(Automatic net weighing machine is a product of Exact Weight Scale Company, Dept. CP, 909 W. Fifth Ave., Columbus, Ohio . . . or for Check CP 4688, pages 2 and 3.)

**Any location suitable
for bag closer**

Bag closing machines designed for cable suspension from overhead mounting, using either a top balance or counter-weight, are described and illustrated in four-page bulletin.

Bul 201 is available from Union Special Machine Company, Dept. CP, 465 N. Franklin St., Chicago 10, Ill. Check CP 4689 on handy form, pages 2 and 3.

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LIGHTING, BUT...

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When inquiring check CP 4690 on handy form, pgs. 2-3

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PRESSURES TO
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Engineering Corporation

1144 WEST 135TH STREET, GARDENA, CALIFORNIA

When inquiring check CP 4691 on handy form, pgs. 2-3

CHEMICAL PROCESSING

(Continued from page 113)

with a spout, prevents any small bits of paper or cardboard from getting into the powder. Thus, the purity of the plastic in the finished product is assured.

Container itself consists of two double-wall body sheets, each constructed of 600 Mullen test corrugated board, and double-wall telescoping covers of 600 Mullen test. Two methods are recommended for unloading these bulk boxes. One utilizes a sheet, scored and taped four to five inches from container's bottom. Protected by a heavy-duty flap stapled to box, scored sheet is merely slit when box is ready to be emptied (see photos). Box can also be emptied from a floor location close to mixer or hopper. An aspirator then draws powder from box. BECO uses the former procedure.

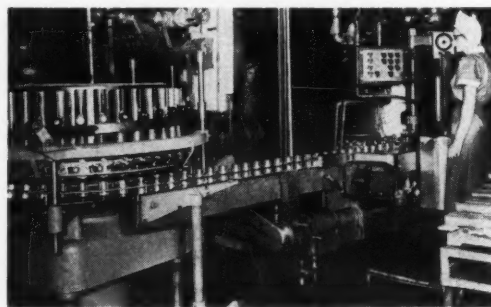
(Bulk container is a product of Hinde & Dauch Paper Co., Dept. CP, 5103 Decatur St., Sandusky, Ohio. Check CP 4692 on handy form, pages 2 & 3.)

Can closing machinery is capable of speeds to 1000/min . . .

precision unit incorporates hydraulic drive to control accelerations, decelerations

Uses: High-speed closing of cans filled with liquid and semi-liquid products.

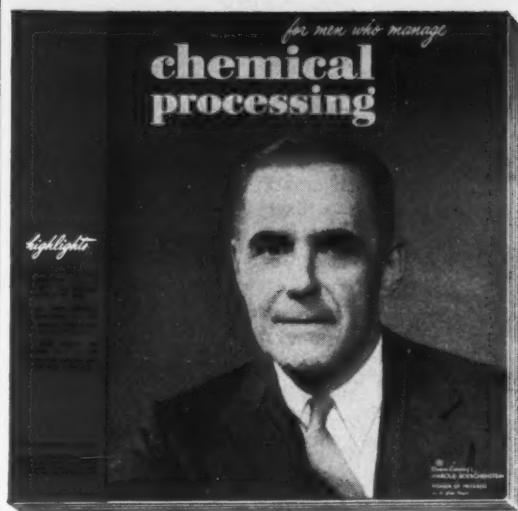
Features: Precision closing machine is capable of operating at the rate of 1000 cans per minute.



Cans actuate cover feed

Description: High-speed closing machine incorporates use of a hydraulic drive to control rapid accelerations and decelerations that result from high speed. To assure continuous delivery of can covers at maximum speed, dual cover-feeds are employed. They are actuated by cans passing through a magnetic field.

(High-speed can closing machine is a product of Continental Can Company, Dept. CP, 100 E. 42nd St., New York 17, N. Y. . . or for more information check CP 4693 on handy form, pages 2 and 3.)



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That's why . . .

. . . *Chemical Processing* is sent only to qualified readers . . . selected management and technical key-men in the chemical industry; that's why you get *Chemical Processing* free — that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

Chemical Processing

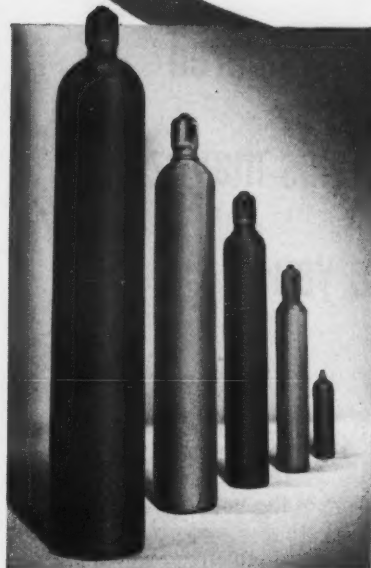
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Need Cylinders? Cylinders Problems?

consult **HARRISBURG STEEL**



Natural... the biggest producer builds them best. In a complete range of sizes and capacities from 14 to 400 cubic feet... in both Domestic and Export types... to I.C.C. Specifications... for storage and transportation of fixed, liquid, and medical gases. If you need cylinders or have a technical problem concerning cylinders... consult us. Or write for a catalog and prices... today.

HSC-CC-1/54

Harrisburg Steel
CORPORATION
101 Years in Pennsylvania's Capital
HARRISBURG 24
PENNSYLVANIA

When inquiring check CP 4694 on handy form, pgs. 2-3

VERSATILE BULK FEEDING... from a trickle to a torrent with VELOFEEDER

A mechanical vibrating feeder especially designed for free-flowing chemicals, fertilizer, pellets and similar materials at lower cost, higher efficiency.

Here's Why!

Higher Output—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

Lower Power Needs—1/8 hp. motor powers unit—inexpensive as a 100-watt light bulb!

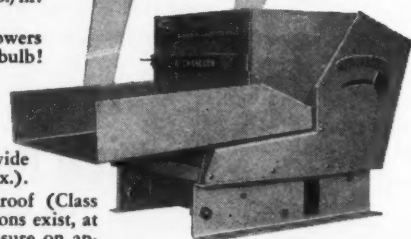
Smaller Space Needs—35 inches long, 17 1/2 inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

Easier Control—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

Safer Operation—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure on application.

Less Vibration—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).

If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.



Richardson SCALE COMPANY, Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Detroit • Houston • Memphis • Minneapolis
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 4695 on handy form, pgs. 2-3

PACKAGING

Carboy with spigot stores, dispenses distilled water

By attaching polyethylene spigots to Plaxpak carboys and utility bottles, an aspirator bottle has been produced from the unbreakable plastic containers, stock items of Plax Corp., Hartford, Conn.

An important application of the aspirator bottle is for storing and dispensing distilled water. Water can be distilled directly into bottle and then dispensed through the spigot.

A half-inch spigot is used with 6 1/2 and 13 gallon carboys and a quarter-inch spigot with two-gallon utility bottles. Smaller spigot is welded into a boss, which is in turn welded into side of bottle. Larger spigot is screwed into boss.

Polyethylene aspirator bottles are lightweight, unbreakable, highly resistant to acids and alkalis, and relatively inexpensive.

(Plastic aspirator bottles are products of The Nalge Co., Dept. CP, 627 S. Goodman St., Rochester, N. Y. . . . or for more information check CP 4696 on handy form, pages 2 and 3.)

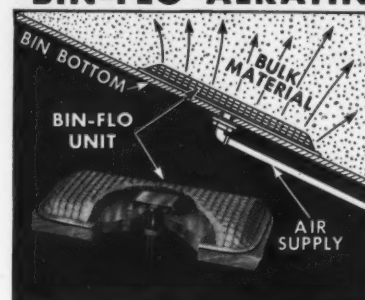
Liquids, creams, pastes filled economically

Low-priced machine which provides versatility in filling liquids, creams, and pastes is pictured and described in two-page bulletin. Metered-volume filling on unit eliminates necessity of over-filling of tubes, resulting in savings. Complete specifications of unit are tabulated.

This same bulletin also briefly describes units for filling bottles, cans, and jars with various liquids.

Form No. AC-30 is issued by Arthur Colton Company, Division Snyder Tool & Engineering Company, Dept. CP, 3401 E. Lafayette Ave., Detroit 7, Mich. When inquiring specify CP 4697 on handy form, pages 2 and 3.

BIN-FLO AERATING UNIT

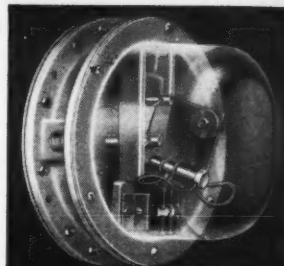


Provides Steady Flow of Dry, Finely Ground Materials which tend to bridge in storage. Uses only small amount low-pressure air.

BIN-DICATOR BIN LEVEL INDICATOR

For All Bulk Materials

signals change in level; automatically starts and stops filling and emptying equipment.



THE BIN-DICATOR CO.
13946-D Kercheval • Detroit 15, Mich.

NEW
DETAIL DATA
BOOK
FREE

When inquiring check CP 4698 on handy form, pgs. 2-3



alphabetical index on page 170

... for alphabetical index of all processes, materials, services, and equipment discussed in this issue's editorial columns and advertisements, turn to page 170. "Quick-locator" starting on that page was a feature in **CHEMICAL PROCESSING** years ago. It means extra work for the Editors, but it helps you, the reader, in finding what you want ... in a hurry!

PACKAGING

Makes P-S tape economically, as-needed from paper, film, or cloth

Uses: For large industrial users of pressure-sensitive tape where unit can be installed in production line to handle any standard taping operation, such as sealing, labeling, packaging, binding, strapping, and wrapping.

Features: Tape-making machine produces fresh-made tape as needed. It can be stopped and started again for any length of time without trouble, and is always ready for operation the next day.

Costs are cut by using unit since large economical rolls of paper or film can be utilized instead of prepared pressure-sensitive tape. It also enables use of a greater variety of tapes than are available in prepared form.

Unit can apply adhesive film coat to practically any material thus providing specific kind of tape to fit the job. Cloth, paper, impregnated stock, films, foil, and cellophane can be handled.

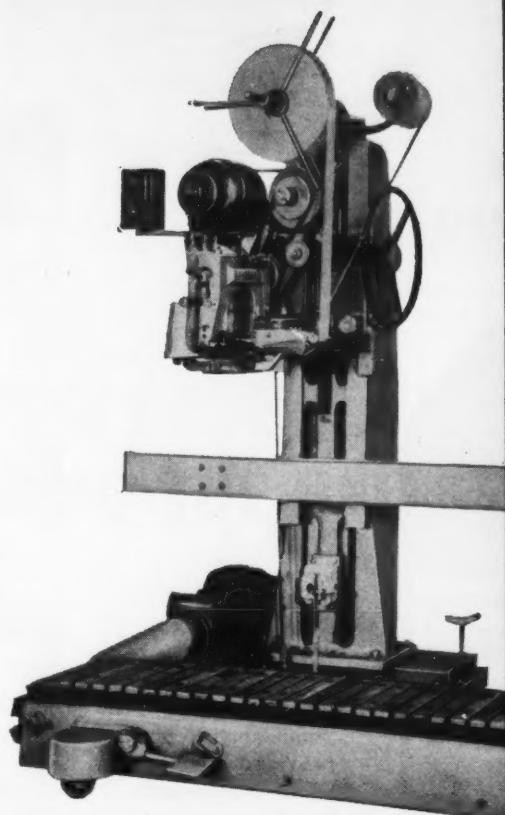
Description: Tape-making unit, called the Tape-maker, is enclosed in a metal cabinet about 18" square and 5' high. It handles tape from as narrow as 1/4" to as wide as 3" in large rolls.



Costs are cut as tape-making machine uses large economical rolls of paper or film instead of prepared pressure-sensitive tape

In operation tape from roll passes down and under adhesive roll and up to cabinet which is supplied with small fin heater and blower, then out ready for use. There are no adhesive filling problems since 5-gallon drum of adhesive with special spout is merely inverted over supply vat.

(Tape-making machine is a product of Williamson Adhesives, Inc., Dept. CP, 8220 Kimball Avenue, Skokie, Illinois. Check CP 4700, pages 2 and 3.)



TAKE ADVANTAGE OF THESE 5 MODEL ET BAGPAKER FEATURES:

- One operator finishes 15 bags a minute when filled bags are delivered continuously to the conveyor
- Adjusts to bags from 25 to 100 lb. capacity
- Caster-mounted, the Model ET is easily moved to widely separated packaging stations
- Bag starts and stops sewing head when equipped with automatic sewing head control
- Automatic brake on Howpner No. 150 Heavy Duty sewing unit prevents "coasting"

model **ET** Bagmaker[®]
tapes and sews
15 bags per minute

Here's the perfect teammate for your present filling and weighing equipment—the most efficient way to get better protection and faster packaging at the lowest possible cost.

Here's how the Model ET Bagmaker works: One operator receives bags from your weighing and filling machine. In four seconds or less the Bagmaker has applied creped "kraft" sealing tape over the bag end, sewn a reinforced "cushion stitch" through both tape and bag, and trimmed the tape. You can't beat that for efficiency and speed.

Booklet ET gives you complete details and dimensional drawings, shows you how perfectly Model ET fits into your existing filling set-up. There's no obligation—just write to: **P-16**

International Paper Company, Bagpak Division
220 E. 42 Street, New York 17

International Paper COMPANY
BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Des Moines • Detroit • Kansas City, Kansas • Los Angeles • Louisville • Minneapolis • New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

When inquiring check CP 4701 on handy form, pgs. 2-3

Custom Built at competitive cost of standard equipment

M & L Heat Exchange Equipment offers all the advantages of "STANDARDIZED FLEXIBILITY"

—the advantages of fitting the equipment to your specific needs—custom built from standard basic elements. Saves time, cost and design drudgery.

M & L DEPENDABILITY—Thousands of successful heat exchange installations attest to the dependability of our "Standardized Flexibility".

M & L ENGINEERING SKILL compasses visual imagination, common sense and a full interpretation of your needs. Results are clearly, logically, quickly accomplished.

M & L EXPERIENCE, in stacks of case histories, and similarities of needs, leads to a quick, satisfactory determination of the type, size and construction of required equipment.

M & L ECONOMY—A combination of all these advantages adds up to real savings in initial as well as operational costs.

You can rely on
M & L EQUIPMENT

Inquires are invited.
There's a bulletin for every chemical processing and heat exchange equipment need.

Manning & Lewis
Engineering Company

30 Ogden Street Newark 4, New Jersey
SALES REPRESENTATIVES IN PRINCIPAL CITIES



processing equipment



Cake obtained from centrifuge (left) is added to top of feeder, resulting particles passing to drying tray at bottom

Small particle size
provided by feeder
which continuously
breaks up cake —

increases dryer capacity, makes grinding easier

**Safer operation results through use of unit
which has required no maintenance
except lubrication since installed two
years ago**

Problem: Former manual method of breaking-up a solid cake so that moisture could be removed in a vacuum dryer, at Hoffmann-La Roche Inc., Nutley, N. J., was slow and laborious. Cake, consisting of an intermediate used in the manufacture of Vitamin B-1, comes from centrifuge. It has to be broken up preparatory to drying and grinding.

Previous procedure was to cut cake with knives by hand. Hardness of cake made this

method difficult. Also, lumps produced were not as small as is necessary for best operation of drying and grinding equipment.

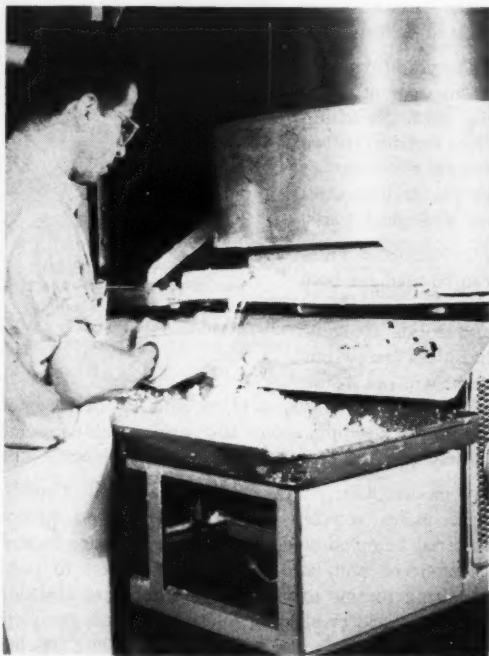
Solution: About two years ago, plant placed a Com-Bin feeder in operation. Before entering this unit, material is reduced to about 50% moisture content in two Tolhurst centrifuges. Cake is continuously fed into top of feeder, as shown, and removed from bottom on drying trays.

When inquiring check CP 4702 on handy form, pgs. 2-3

Feeder consists of a cylindrical shell mounted concentrically on a vertical shaft by means of spider arms. Below the cylinder, and fixed to the same vertical shaft, is a circular plate larger in diameter than the cylinder. Hence — cylinder, table, and material are rotating as one.

Position of plate in relation to cylinder is such as to leave an annular space between top of plate and bottom of cylinder. Stationary plow extending through this space, just above circular plate, strips off bottom of material in cylinder as the cylinder and plate revolve. Material flows continuously to bottom by gravity.

Results: Feeder has simplified operation and enabled plant to increase capacity with same number of employees. Several hundred pounds an hour can be cut by machine — three or four times the previous rate. Smaller particle size reduces volume of substance to be dried. This allows more of material to be placed on each drying tray, increasing capacity of dryer. Smaller particle size also makes grinding much easier.



Close-up shows feeder in operation as it cuts up material and allows it to fall on drying tray

Present procedure for breaking up cake is much safer than former method. No maintenance except lubrication has been necessary on feeder since it was placed in operation.

(Com-Bin feeder is product of Pulva Corporation, Dept. CP, 550 High St., Perth Amboy, N. J. . . . or for more information check 4703 on handy form, pages 2 and 3.)

apades in
industry

Take pity on Herman
(an overworked engineer).

With time at a premium, busy, busy Herman had to devise a method for removing highly corrosive pickling liquor from a tank. Since the tank was constructed with a rubber membrane and a brick lining, it was important that the rubber membrane not be broken for a drain connection.

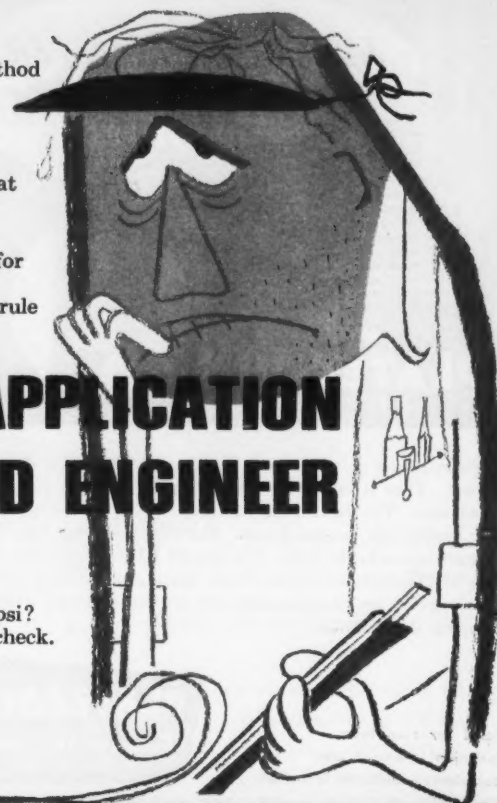
Herman decided a jet was ideal for the job. Herman was right! He took pencil, paper, and slide rule in hand and settled down to

THE CASE OF THE JET APPLICATION AND THE OVERWORKED ENGINEER

work out the problem . . .

Syphon? Eductor? Exhauster, compressor, jet vacuum pump? psi? gpm? Derivation, computation, check.

Herman was wrong! And, he knew it—knew there had to be an easier and better way. So this is what he did . . .



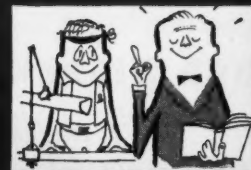
When I saw the Schutte and Koerting Bulletin, I was interested in the "Jet" and what it would do for me. I wanted to know about the characteristics, variables, and ranges of the apparatus.

SOLVED THE PROBLEM EASILY!

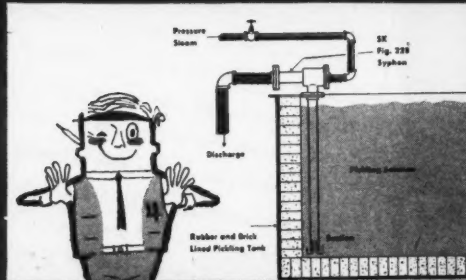
The SK Fig. 228 Syphon Jet System, made of special corrosion resistant materials, is being used to empty spent pickling liquor from a pickling tank. Since the liquor is corrosive and the tank is lined with rubber and brick, draining is done from the top. The syphon provides high velocity jet, certain clearance, is simple and foolproof operation.



It has been found that a syphon jet is the best way to empty a tank of pickling liquor. The jet is applied to the bottom of the tank and the liquor is forced out of the tank.



The SK Fig. 228 Syphon Jet System is a simple and foolproof way to empty a tank of pickling liquor.



Moral! Request a copy of Bulletin J-1 for your files. Make use of a qualified specialist, your nearest SK Sales Engineer.



Schutte and Koerting

COMPANY
MANUFACTURING ENGINEERS

2215 STATE ROAD, CORNWELLS HEIGHTS, BUCKS COUNTY, PA.

Jet Apparatus • Heat Transfer Equipment
Strainers • Condensers and Vacuum Pumps
Oil Burning Equipment • Rotameters
Flow Indicators • Radiant Tubes • Valves
Spray Nozzles and Atomizers • Gear Pumps
Desuperheaters

When inquiring check CP 4704 on handy form, pgs. 2-3



A Platecoil has more heat transfer area than a pipe coil twice its size. Thus it takes only half as much Platecoil to heat a given area. You have 50% less steel to pay for so you can save nearly 50% in initial cost. The Platecoil takes only half as much space in the tank. The greater BTU transfer per unit area of Platecoil also means faster heating or cooling. Platecoils require less maintenance and can be removed without dumping the solution.

Send for complete technical manual and descriptive Bulletin No. P54

When inquiring check CP 4705 on handy form, pgs. 2-3



Delivers demineralized water in continuous flow under pressure at from 5 to 25 gallons per hour. Connects to any water line. Like turning on a faucet. Minerals are chemically removed from water by ion-exchange. No heat or cooling water employed. Uses high capacity replaceable cartridge. Hundreds of uses in industry. Bulletin #128 describes most of them.

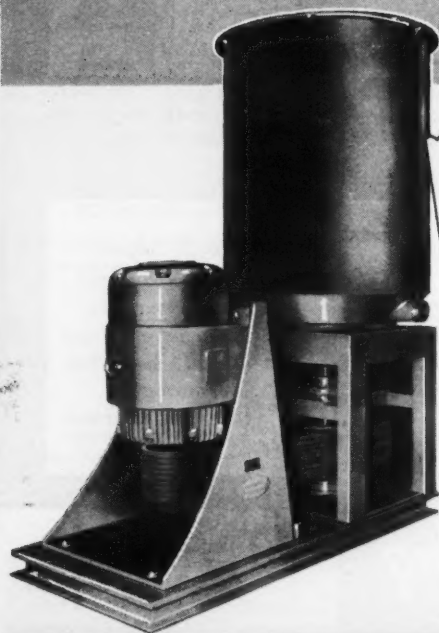
Write for Bulletin #128

Barnstead
STILL & STERILIZER CO.

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 4706 on handy form, pgs. 2-3

ABBÉ DISPERSALL MIXER... "Eliminates 2 to 4 handlings of the product, thereby saving considerable labor on every batch"



Gentlemen:

Prior to the purchase of our first Abbe Mixers it was common practice to cook and mix material in kettles, drain into holding tanks and either pump or shovel to roller or ointment mills, followed sometimes by handling into another tank for cooling. From this you can see that with the Abbe Mixer, cooking, mixing, milling and cooling in one machine does eliminate from two to four handlings of the product, thereby saving considerable labor on every batch. In the manufacture of products containing oily substances, this unit has greatly improved the cleanliness of the operation, the floors and the building itself.

Yours very truly,
Wm. H. H. H. H.

ABBÉ ENGINEERING COMPANY

Address Department 46

50 CHURCH STREET
NEW YORK 7, N. Y.

When inquiring check CP 4707 on handy form, pgs. 2-3

PROCESSING

Large filtering area provided by annular-design element in double-duty filter . . .

uses either fabric bag or porous stone media; elements are easily switched

Uses: General filtration work in chemical, pharmaceutical, petroleum, food, and other industries.

Features: Compact mobile unit uses double-walled cylindrical filter element constructed of either 1) stainless steel wire-mesh supporting a form-fitted fabric bag, or 2) porous stone.

Solution filters through both the inside and outside walls at the same time, into the annular space between — providing a double filtering area, which results in large volumes being handled in a relatively small space. Filtered solution leaves annular space through pipes located at top.

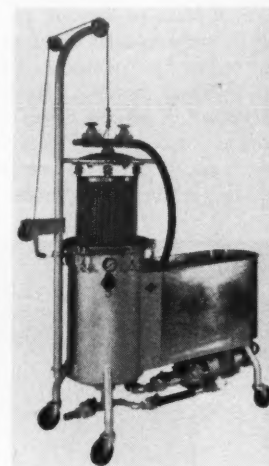
Elements provide up to 20 sq ft of filtering area. Switching from metal to porous stone element is simple and requires no additional parts.

Description: Filter can be used for both liquid clarification and solids recovery. Stainless steel element will not distort under pressure, is easy to clean, and can be used for practically all applications. Bags are available in wide variety of materials.

All models have stainless steel precoat tank. Centrifugal pump recycles precoat material and pumps material being filtered. Operating valves are located at front of unit, and there is easy access to parts requiring routine maintenance. Systems are available for either acid or alkaline solutions and are complete with valves, pump, and motor. Filter element attaches to cover of tank and is easily removed for cleaning. Larger models can be fitted with hand-operated davit for lifting cover and element.

Large-capacity stationary filters are also available. These have leaf-type elements instead of the annular design. Standard models have up to 175 sq ft of filtering area and 18,000 gph capacity.

(Sel-Rex filters are product of Bart-Messing Corporation, Dept. CP, 229 Main Street, Belleville 9, New Jersey. . . or for more information check CP 4708 on handy form, pages 2 and 3.)



Filter element (shown without fabric bag) is easily removed for cleaning. Hand-operated davit is optional

Built for crusher has 15 ft

accept range

Uses: plastics, a

Features: inch chum Unit occu handles u

Description:

Crusher space inches

plied on pipe 'sta

(Suprem Miller a East Or tion che

Device from r

Drain paper syphon bulle At lo dryer that can Bul Dept gan.

PROCESSING

Built for continuous heavy service, crusher handles all waxes, has 15 ton/hr capacity . . .

accepts up to 16 1/2-inch chunks; output size ranges from 1/2 to 4 inches

Uses: For crushing waxes, chemicals, drugs, plastics, and other solids.

Features: Accepts any size or shape up to 16 1/2-inch chunks. Output size ranges from 1/2 to 4 inches. Unit occupies floor space 38 1/2 x 36 x 57 inches high, handles up to 15 tons per hour.

Description: Crusher is designed for continuous heavy duty service. Operation is based on toothed single roll principle. Machine is constructed of high quality semi-steel with tool steel crushing teeth. Stainless steel, monel, hot dip galvanize, or tin coating construction is also available. Various types of rolls can be supplied.

Unit has built-in gear reduction and is available with motors ranging from 1 1/2 to 10 hp. Discharge height is 24 inches, accessible from front or rear.

Crusher can be supplied on integral stand or mounted on wide frame pipe stand for higher discharge clearances.

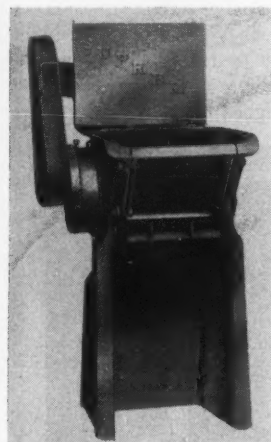
(Supreme 502 crusher is product of Franklin P. Miller and Son, Inc., Dept. CP, 36 Meadow Street, East Orange 6, New Jersey . . . or for more information check CP 4709 on handy form, pages 2 and 3.)

Device quickly removes water from revolving dryers

Draining revolving dryers is an old problem in paper-making industry. Fundamental principles of syphon scoop are explained in illustrated four-page bulletin.

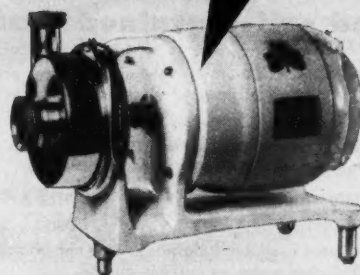
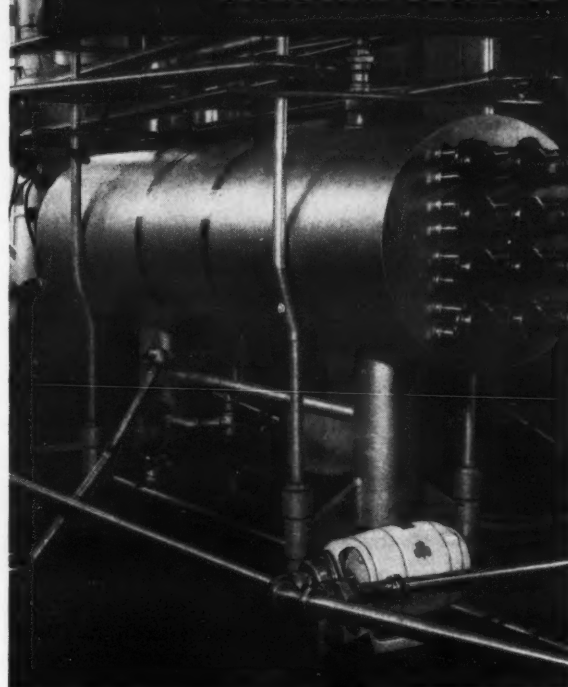
At lower speeds, scoop removes condensate from dryer just as fast as it is formed. Design is such that at rimming speeds only 1/16" film of water can exist around inside circumference of shell.

Bul 266 is issued by Armstrong Machine Works, Dept. CP, 880 Maple Street, Three Rivers, Michigan. Check CP 4710 on handy form, pages 2 & 3.



Crusher occupies floor space 38 1/2 x 36 x 57 inches high, weighs about 800 pounds

TRI-CLAMP "Return Cups" provide simple, fast disassembly for cleaning CHESTER-JENSEN HEATER



Included on the Chester-Jensen heater system is the Tri-Clover "Pump King," one of a complete line of Tri-Clover sanitary pumps—that years of service have proven will out-perform and out-last any other centrifugal pumps available to the dairy industry. These pumps feature: *Wide choice of seals—Design that actually exceeds 3A sanitary standards—Streamline heads for faster assembly and disassembly—Patented impeller for higher efficiency—Pump heads that can be turned 360 degrees to simplify installation*—and many other features which make it the most "copied" pump in the industry. For full details, send for Pump Catalog 253.

LADISH CO.

Tri-Clover DIVISION
KENOSHA WISCONSIN

S155



. . . can be used for "take-down" or cleaned-in-place service

• This Chester-Jensen Heater is unique in that it does not employ conventional methods of return flow. Instead, a stainless steel return cup takes the place of complex return covers or fitting assemblies. The return cup is held in place with a simple TRI-CLAMP toggle union.

The advantages of these Tri-Clover snap-action clamps are obvious—faster, simpler original assembly at lower cost—and speedy disassembly for cleaning, inspection, or replacement.

While this is a specialized application of the exclusive Tri-Clover TRI-CLAMP principle, the same basic advantages apply to the full line of TRI-CLAMP stainless steel ells, crosses, tees, laterals, etc., for use in either "take-down" or cleaned-in-place lines. When installed in "take-down" lines, the "easy on and off" feature means a tremendous savings in labor at wash-up time. When used in C-I-P lines, Tri-Clamp fittings offer important savings in both original cost and in maintenance expense.

SEND FOR NEW CATALOG

Complete details and specifications covering the full line of TRI-CLAMP Stainless Steel Fittings are available in the new Tri-Clover Catalog 1-154. Send for your copy today.



See your nearest TRI-CLOVER DISTRIBUTOR
EXPORT DEPT., 8 So. Michigan, CHICAGO 3, U.S.A. Cable: TRICLO, CHICAGO

When inquiring check CP 4711 on handy form, pgs. 2-3

NEW "Small" boiler is a Big Quality package!



Available in sizes 15 through 100 hp — heating or processing steam or hot water. A complete unit from a single source. (Other Cleaver-Brooks boilers in sizes through 500 hp.)

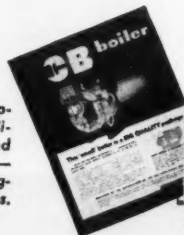
CLEAVER-BROOKS
modern **C-B boiler**

NO BOILER HAS EVER OFFERED SO MANY ADVANTAGES AND QUALITY FEATURES AT SUCH LOW INITIAL COST

• This NEW CB boiler has EVERYTHING needed to bring *big boiler standards* to commercial, industrial and institutional users with small capacity requirements. Despite its unusual, compact size you get big boiler performance — from matched-quality components, proved the world over on thousands of Cleaver-Brooks self-contained units.

Get all the facts NOW on how the new CB can help you save dollars. Make it a point to see . . . and *hear* the most silent-running, biggest boiler value available anywhere!

Call your nearest CB boiler representative (see your phone directory) or send for this illustrated catalog describing the NEW CB — designed by Cleaver-Brooks, originators of self-contained boilers.



gives you all the quality features of time-tested self-contained design

- ✓ **FOUR-PASS FIRETUBE CONSTRUCTION** — longer gas travel scrubs heat from flame — means lower fuel costs — guaranteed efficiency of 80% when firing with oil.
- ✓ **SILENT OPERATION** — even at peak load this boiler more than meets the low sound levels required for schools, hospitals, institutions.
- ✓ **FULL FIVE SQUARE FEET** — of heating surface per boiler hp — for longer service life and low maintenance.
- ✓ **FUEL FLEXIBILITY** — burns available light oil, gas, or combination oil/gas — simple, quick fuel changeover on oil/gas models.
- ✓ **FAST, EASY MAINTENANCE** — front and rear doors hinged for fast inspection, cleaning or servicing boiler.
- ✓ **AUTOMATIC SAFE OPERATION** — all controls centralized and conveniently located — modern electronic combustion control is standard equipment.
- ✓ **COOLER BOILER ROOM** — fiber glass blanket insulation and 16 gauge metal sectional lagging are non-corrosive, moisture and heat resistant.
- ✓ **FULLY APPROVED** — by Underwriter Laboratories; conforms to ASME codes; factory tested before shipment.

NOW — FIRST SIZES OF THE CB BOILER ARE MADE IN CANADA, TOO

Cleaver Brooks

Cleaver-Brooks Company, Dept. A, 349 E. Keefe Ave., Milwaukee 12, Wisconsin, U.S.A.
Cable Address: CLEBRO — Milwaukee — All Codes.
Originators of the Self-Contained Boiler

When inquiring check CP 4712 on handy form, pgs. 2-3

PROCESSING

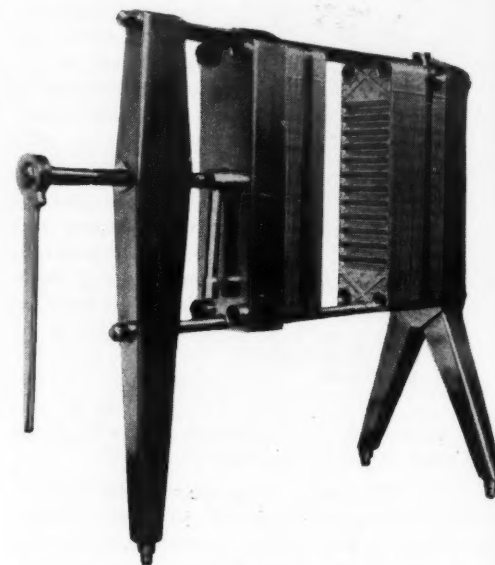
Flexibility, easy cleaning featured in plate heat exchanger . . .

can be sectionalized to perform separate operations simultaneously in the same frame

Uses: Heating and cooling in the chemical, pharmaceutical, and food industries.

Features: Exchanger has high heat transfer efficiency, flexibility, and is easy to clean. Separate heating, cooling, regeneration, or chilling operations can be performed individually or in combination at the same time, simply by dividing the unit into sections with connector plates.

Description: Model HX paraflow heat exchanger consists of a number of parallel stainless steel plates, spaced and sealed by rubber gaskets, and held together in a stainless steel frame. Treated liquid and heating (or cooling) medium flow between alternate plates. Plates have troughed surfaces which inter-



Capacity or duty of heat exchanger can be varied

lock when plates are brought together.

Plates hang between top rail and bottom guide bar and slide independently when machine is opened. Surfaces of plates are fully accessible for easy cleaning when in the open position. Plates measure 2'9" x 9". Frame will hold up to 150 plates. Capacity or duty of exchanger can be varied simply by adding or removing plates.

Unit withstands maximum pressure of 100 psi and has full capacity of about 4000 gallons per hour (for ordinary heating or cooling applications).

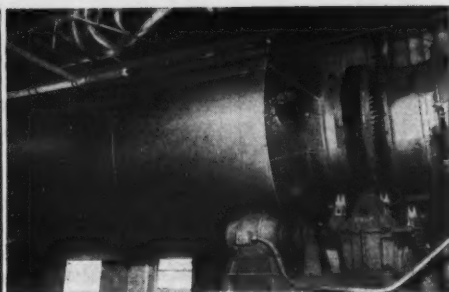
(Paraflow heat exchangers are product of Walker-Wallace Division, A.P.V. Company, Inc., Dept. CP, 137 Arthur Street, Buffalo 7, N. Y. Check CP 4713 on handy form, pages 2 and 3.)

**Chemicals
are Dried
Completely,
Quickly,
Economically**

in

DehydrO-Mat*

* PAT. PENDING



BUILT IN A WIDE RANGE OF CAPACITIES, the DehydrO-Mat, though comparable in price, out-performs conventional dryers of similar size. Compact . . . easy to install in a minimum of space.

The DehydrO-Mat will not scorch or burn even the most sensitive chemicals. Air, not inclination, moves the material . . . quickly through the hot zone, slowly through the temperate zone. Since no boiler is necessary, the DehydrO-Mat can be in full operation from a cold start within ten minutes. DehydrO-Mats utilizing steam-heated air are also available.

Consult the Renneburg Engineers
on all your drying problems.
FREE literature and information on request.

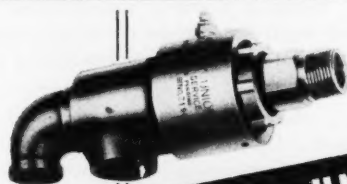
EDW.

RENNEBURG

& SONS CO.

Baltimore 24,
Maryland, U.S.A.

When inquiring check CP 4714 on handy form, pgs. 2-3



TYPE "S"
ROTARY UNION

The ROTARY UNION*
is self-adjusting
self-aligning

**Now
designed
for Field
Repair**

The ROTARY UNION has a precision mechanical seal which uses neither packings nor springs. It is so designed that the pressure is automatically adjusted to fluctuations in the fluid pressure of the application. There are 40 standard types and sizes of the ROTARY UNION, for applications such as Steam up to 150 PSI, Hot Oil to 500°, Coolants, Air, Gases, Water, Brine, and Alternate Mixtures at speeds up to 1000 RPM. Direct factory engineers are available at all offices to recommend the proper ROTARY UNION for your specifications. Contact our nearest office for consultation or write Dept. 1C for catalog.

"Where Good Connections Count"®

* Trade Mark — Patented

Camden, N. J.

PERFECTING SERVICE CO.

(Home Office and Factory)

332 Atando Ave.

Charlotte, N. C.

Chicago
Cleveland
Providence
New York
Montreal
Toronto

When inquiring check CP 4715 on handy form, pgs. 2-3

PROCESSING

**Platecoils available
in various shapes
and sizes . . .**

may be rolled into cylinders
or sections thereof

Uses: Heating and cooling of
tanks, kettles, and similar vessels.

Features: Units are easily in-
stalled and simple to clean. They
are light in weight and available
in various shapes and sizes.

Description: Platecoils can be
supplied in any material that may
be spot- and seam-welded by re-
sistance welding methods. Standard
units are embossed on both sides.
Single embossed construction is
used where flat heat exchange sur-
face is required.

Number of sections may be as-
sembled to form bank to meet re-
quirements of specific application.
Tanks may be factory assembled
where one or more of sides con-
sist of single or double embossed
units, or they may be assembled to
form baffles within tank.

Platecoils can be rolled to form
cylinders or sections of cylinders
within certain limitations.

Standard sizes include 12, 18, and
22 inch widths. Lengths vary from
23 to 119 inches. Single embossed
section is 9/16 inch thick, double
embossed is 1 inch thick. Length
and width may be supplied to meet
exact specifications.

(Thermo-panel platecoils are prod-
uct of Thermo-Panel Division,
Dean Products, Inc., Dept. CP, 616
Franklin Avenue, Brooklyn 38,
N. Y. Check CP 4716 on handy
form, pages 2 and 3.)

**Gives sizes, capacities
of stainless tanks**

Stainless steel tanks for stor-
ing, mixing, blending, and
processing chemicals, pharma-
ceuticals, and food products,
are described in 2-page folder.

Tank bulletin is issued by Pot-
ter and Rayfield, Inc., Dept.
CP, P. O. Box 1042, Atlanta,
Ga. Check CP 4717, pages 2-3.

NOW

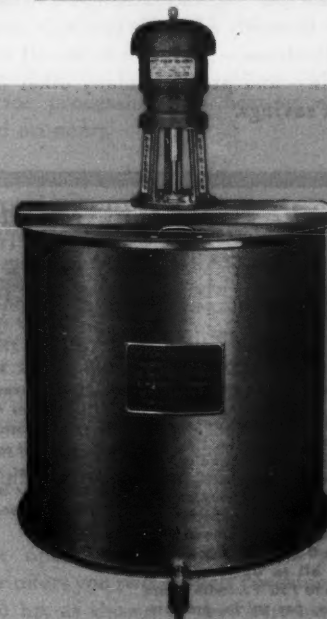
**STANDARDIZED
for 90% of all mixing jobs**

LOW INVESTMENT

HIGH VERSATILITY

QUICK DELIVERY

plus



**The New PATTERSON
Unimixer**

**For efficient processing of liquids and
light pastes—at Lower Mixing Costs!**

Easy to Buy—

Easy to Use!

Write for details now.



Patterson Unimixer
Turbine

The Patterson Foundry and Machine Company
East Liverpool, Ohio, U. S. A.

The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada

When inquiring check CP 4718 on handy form, pgs. 2-3

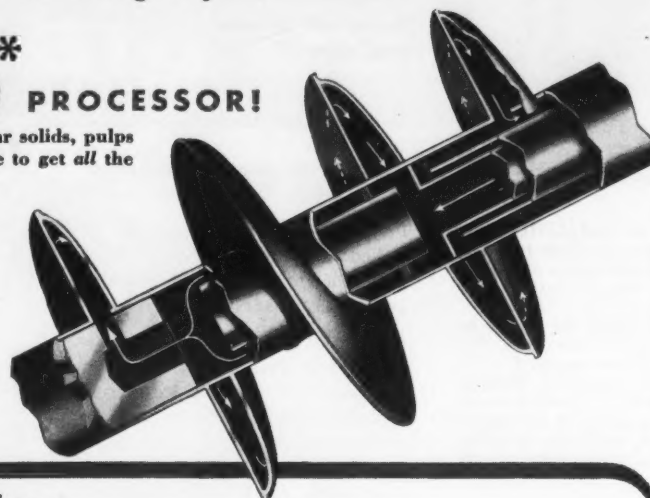
if you have a Cooling...Heating...or Drying problem

investigate the revolutionary advantages of...

THE **holo-flite*** PROCESSOR!

If you have processes where slurries, granular solids, pulps or pastes are cooled, heated or dried, be sure to get all the facts on HOLO-FLITE advantages.

HOLO-FLITE handles such processes — in continuous flow — in as little as 1/5th the space of other types of heat exchangers. What's more, it is readily adaptable to a wide range of applications — is simple to install and maintain — and provides many other important savings.



typical HOLO-FLITE advantages...



ITS APPLICATION FLEXIBILITY is almost unlimited. It cools, heats, or dries. It handles granular solids, pulps, pastes, slurries and fluids with equal ease. Its heat transfer agent can be water, refrigerant, hot oil, Dowtherm, steam or other liquids or vapors at any of a wide range of temperatures. It cools materials in ranges from 1800°F to 0°F. It heats and dries with hot oil to 600°F...with Dowtherm to 750°F...with steam to 150 lbs. per sq. in. pressure.



THE LARGE HEAT-TRANSFER SURFACE saves space — HOLO-FLITE requires as little as 1/5th the space of other heat-exchange equipment of comparable capacity. Moreover, a more complete heat transfer is effected, resulting in more uniform processing.



ROTATION IS SLOW — granular and powdered solids are handled with practically no dusting — negligible abrasion. There are no dust recovery problems — a further saving in installation, maintenance and operating costs!



ITS OPERATING CAPACITY is readily adaptable to virtually any requirements by simply varying the diameter, pitch, and length of flights, as well as the number of "tiers." Multi-tier units require no more floor space than single-tier installations!



HOW HOLO-FLITE WORKS...

Basically the HOLO-FLITE consists of one or more flights of hollow-bladed screw conveyors. The product to be processed moves through a trough housing the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums — as the product is continuously moved along in a bulk-flow without interruptions!

GET THE COMPLETE FACTS on Holo-Flite savings and how this field-proven unit can save space, time and money on your processing operations. This eight-page descriptive bulletin will gladly be sent on request. No obligation, of course!



WESTERN

Precipitation

CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

* T.M. Reg. (Hollow-Flite)

When inquiring check CP 4719 on handy form, pgs. 2-3

PROCESSING

High capacity at low cost reported for bubble tray

Simply designed bubble tray, permitting high capacity at low cost, is discussed in four-page bulletin. Tray parts are so proportioned as to provide available slot area of from 12 to 14% of superficial tower area, or generally equivalent to that provided in conventional bubble cap tray.

Entire length of each slotted section is fully effective and there is no interference of vapors issuing from one slotted element with those from another. Complete with photos, drawings, and chart, bulletin gives background, mechanical details, features, and cost information.

Bul 10-M is issued by Badger Manufacturing Company, Dept. CP, 230 Bent Street, Cambridge 41, Mass. Specify CP 4720, pages 2 and 3.

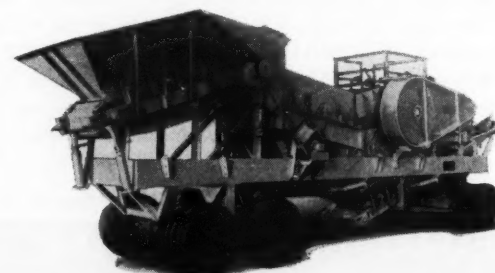
Screening unit ahead of jaw crusher increases production...

permits product size material to by-pass crusher, enables rejection of quarry dirt

Uses: Crushing rock, ores, limestone, and similar material.

Features: Vibrating screen mounted ahead of crusher permits small size material to by-pass crusher, enables rejection of quarry dirt, and increases production.

Description: Mobile primary plant has 36" x 10' apron feeder, 4' x 6' two-deck four-bearing vibrating screen, and 2036 roller bearing jaw crusher. Mounted on pneumatic-tire chassis, unit has proper weight distribution to meet state highway axle load limits. In operation, material is dumped onto apron feeder which delivers it to Mesabi heavy duty vibrating screen. Material retained on steel plate top deck is discharged into jaw crusher; that passing top deck but retained on wire mesh bottom deck goes into receiving hopper of 30" x 18' end delivery conveyor at front of plant. Fines passing bottom deck are carried over a plate to either main delivery conveyor or to hopper of 24" x 25' reject conveyor.



Mobile primary plant has vibrating screen mounted ahead of jaw crusher

PROCESSING

In event of clay build-up, carrying plate may be removed, allowing fines to pass directly into hopper of reject conveyor. Conveyor can be installed to deliver out either side of plant.

Feeder is controlled from operator's platform. Feeder extension permits widening hopper to 11½ ft. On or off plant power is optional, as is front bolster for towing or a Fruehauf pin for truck tractor. Moving height is 12' 7".

(Mobile 150 PRS crusher is product of Pioneer Engineering Works, Inc., Dept. CP, 1515 Central Avenue, Minneapolis 13, Minn. . . or for more information check CP 4721 on handy form, pages 2 and 3.)

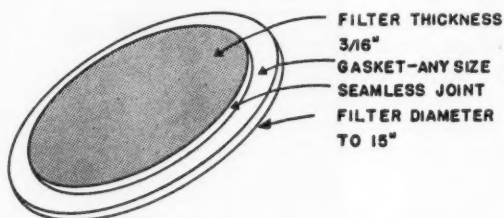
Non-absorbent porous Teflon filters stand temperatures up to 450°F, can handle all reagents . . .

will remove 3-micron particles from liquids, show no strength loss when wet

Uses: For filtering and dispersing liquids and gases.

Features: Filters are capable of removing three-micron diameter particles (and larger) from liquids, and one-micron particles from gases. The porous Teflon has all the corrosion resistance and temperature stability of solid Teflon.

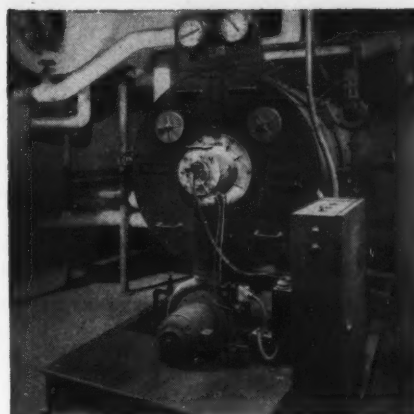
Description: Filters are available in disc form up to 15-inch diameter. Solid Teflon rim provides high tear strength and integral gasketed mounting. Flow capacities up to 45 gallons per minute per square



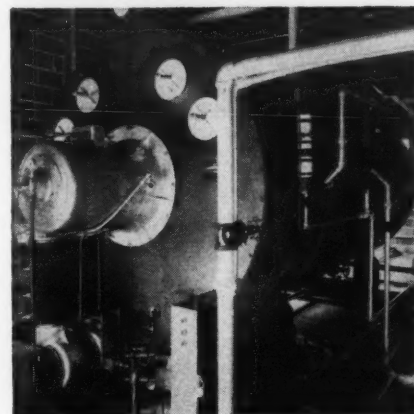
Porous Teflon filter discs have mean pore size of 9 microns

foot of filter (at 5-psi differential pressure) can be obtained with organic fluids of 1-cp viscosity. Discs are non-absorbent, show no strength loss when wet, and are suitable for use at temperatures up to 450°F. Units are well suited for laboratory work. Filters can be used with all commercial acids, caustic, organic solids, fuming nitric acid, aqua regia, and hydrogen peroxide. Discs can be chemically cleaned and sterilized.

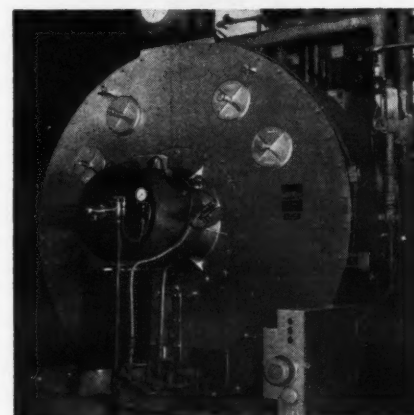
(Porous Teflon filters are product of Porous Filter Company, Dept. CP, Glen Cove, New York. Check CP 4722 on handy form, pages 2 and 3.)



Steam for heating new fertilizer plant is supplied by this 40 hp. Powermaster.



This 400 hp. Powermaster generates 100 psi. steam for processing industrial fish oil.



Process steam at 175 psi. for rubber products plant is supplied by this 300 hp. Powermaster.

CHECKED YOUR STEAM COSTS LATELY?

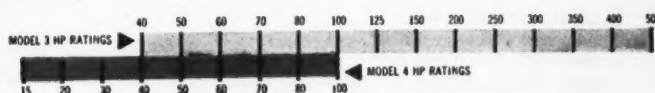
Powermaster®
saves in many ways!

In chemical plants, Powermaster Packaged Automatic Boilers are supplying steam for processing and heating with outstanding reliability and economy.

Powermaster savings start with simplified installation. No special foundation or costly stack is required. As delivered, space-saving Powermasters are completely factory-assembled, fully equipped and wired ready for operation as soon as water, fuel, electrical and flue gas connections are made.

Once installed, a Powermaster keeps on saving with these advantages: high fuel economy at all loads, fully automatic operating and safety controls, maintenance-saving accessibility, hospital-clean boiler room, smokeless combustion and long, trouble-free performance. Powermasters are entirely designed and built by Orr & Sembower, Inc., and are rigidly fire-tested before shipment.

To meet your specific operating requirements to your best advantage, Powermaster offers you two models covering a capacity range of 15 to 500 hp. as shown in the chart below. Oil, gas, or combination oil and gas firing is optional with both models in all sizes.



Pressure range: 15 to 250 psi., steam or hot water.

Check your steam costs, and then check the many cost-saving Powermaster advantages described and illustrated in our latest bulletins. Send for your copies NOW!

Powermaster®

PACKAGED AUTOMATIC BOILERS

Sizes to 500 HP; pressures to 250 psi.

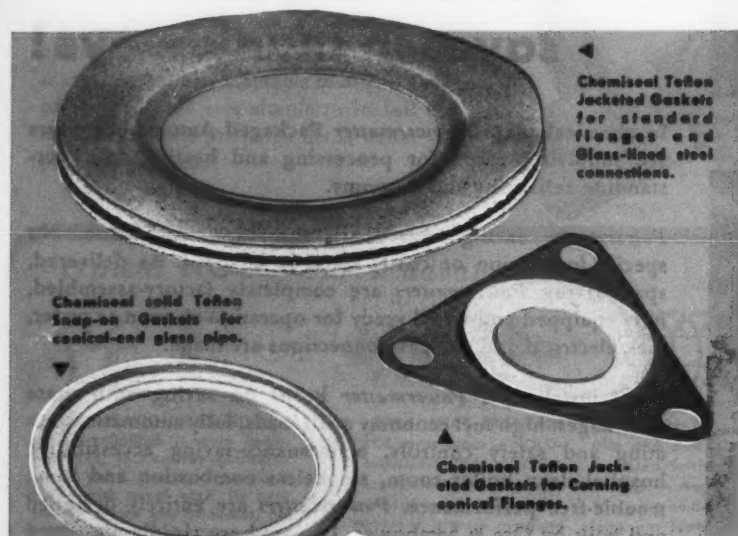
ORR & SEMBOWER, INC. • Established 1885 • Morgantown Road, Reading, Penna.

When inquiring check CP 4723 on handy form, pgs. 2-3

Impervious to

- ACIDS
- CAUSTICS
- SOLVENTS

• non-contaminating



Chemiseal Teflon Jacketed Gaskets for standard flanges and glass-lined steel connections.

Chemiseal solid Teflon Snap-on Gaskets for conical-end glass pipe.

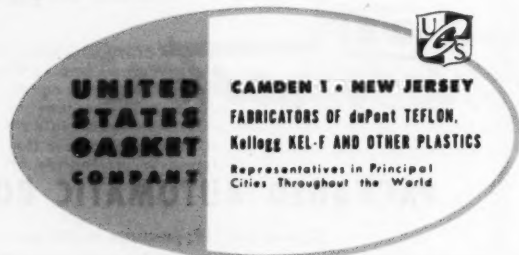
Chemiseal Teflon Jacketed Gaskets for Corning conical flanges.

Chemiseal Gaskets

Here are Gaskets that will seal against any chemical your process equipment and piping can handle—and then some. With proper installation, they will last as long as the equipment, corrosion-wise.

And they are made specifically to suit every connection problem—every pipe and nozzle material requirement, whether glass, ceramics, stainless, Karbate, Haveg, glass-lined steel, etc.

They are designed to protect these costly piping materials—usually low in impact strength—by providing the necessary cushioning effect to permit a positive seal at low bolt loads. Solve your gasketing problems once and for all. Write for Catalog No. TG-953.



UNITED STATES GASKET COMPANY

CAMDEN 1 • NEW JERSEY
FABRICATORS OF DuPont TEFLON,
Kellogg KEL-F AND OTHER PLASTICS
Representatives in Principal
Cities Throughout the World

PROCESSING

Catalog contains over 30 photos of screening installations

Line of screening equipment for removing solids from water, sewage, and industrial waste is described in 28-page catalog. Complete with tables, charts, drawings, and photographs, book covers four coarse screens and three fine screens.

Book 2587 is issued by Link-Belt Company, Dept. CP, 307 North Michigan Avenue, Chicago 1, Illinois. Check CP 4725, pages 2 and 3.

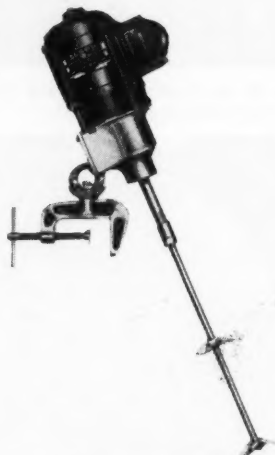
Hollow tube and chuck arrangement provides quick shaft adjustment on portable mixer . . .

permits exact depth setting for best mixing results

Uses: Mixing or blending of solutions, slurries.

Features: Hollow tube and chuck arrangement using locking sleeve provides quick shaft adjustment that does not loosen or jam.

Description: Mixer's two balanced three-bladed propellers are movable over full shaft length, permitting exact adjustment for best mixing results consistent with batch depth. Shaft's outboard bearings are self-aligning, prelubricated, and sealed. Heavy-duty housing and bearing support provides stability and ruggedness for continuous operation.



Mixer has heavy-duty housing and bearing support

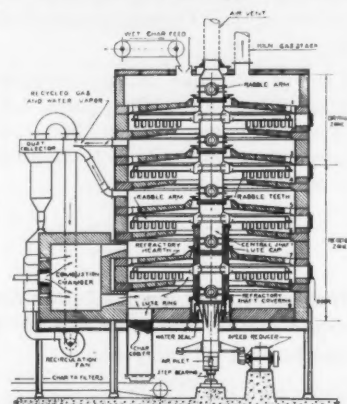
Standard shafts and propellers available are made of stainless steel, Monel, nickel, aluminum, bronze, steel, special alloys, and lead or rubber coated to meet specific conditions. Longer or shorter shafts are also available. Various types of propellers can be supplied.

Mixers are made in direct drive or gear drive models in sizes ranging from 1/20 to 7½ hp.

(Mixers are product of Alsop Engineering Corporation, Dept. CP, Milldale, Conn. Check CP 4726 on handy form, pages 2 and 3.)

NICHOLS HERRESHOFF

Revivifying Kilns



BONE CHAR

Cumulative installed capacity as of:	Rated dry basis tons per day
1938	75
1944	150*
1948	215
1952	350*
1955	600

ACTIVATED CARBON

Cumulative installed capacity as of:	Rated dry basis lbs. per day
1948	26,000
1952	52,000*
1953	78,000
1954	173,000

(*Repeat order)

Let us demonstrate the dollar savings possible through the installation of modern equipment. Complete testing and laboratory facilities available. Please write to:

Nichols Engineering & Research Corp.

70 PINE ST., NEW YORK 5, N. Y.
1637 N. Illinois St., Indianapolis 2, Ind.
40 S. Los Robles Ave., Pasadena 1, Calif.
1477 Sherbrooke St. W., Montreal 25, Canada

When inquiring check CP 4727 on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 4724 on handy form, pgs. 2-3

Simple has no

acc ma

Uses: machine

Feature: Accumulate automa tains st

Description: waters settling obtaine

Incomi: rator b long, bottom upflow through outlet

(Water: ditioni Mfg. New Y reader Reader

Illustr: and d

Con: are draw sign men join wat eng anc

Bul: Bad: Ben: reac: Rea: and

For: You: Dire: proc

Simple white water reclaimer has no moving parts . . .

accumulated solids settle to bottom, are automatically blown off

Uses: For reclaiming waste waters from paper machines.

Features: Machine has no internal moving parts. Accumulated solids settle to bottom of unit and are automatically blown off. Treated water effluent contains stock concentration of 0.25-0.50 lb/1000 gal.

Description: Machine's primary use is for white waters which are of such consistency that simple settling and gravity concentration of stock can be obtained by reducing velocity of the waste water.

Incoming white or waste water flows over air-separator baffle and mixes with chemical (if needed) in long, high-velocity downtake which projects into bottom cone. Accumulated solids are suspended by upflowing water to provide deep bed of sludge through which waste water must pass to flow to outlet collector.

(Water reclaimer is product of Graver Water Conditioning Company, A Division of Graver Tank & Mfg. Co., Inc., Dept. CP, 216 West 14th Street, New York 11, N. Y. . . or for more information reader may simply check CP 4728 on convenient Reader Service slip which is between pages 2 and 3.)

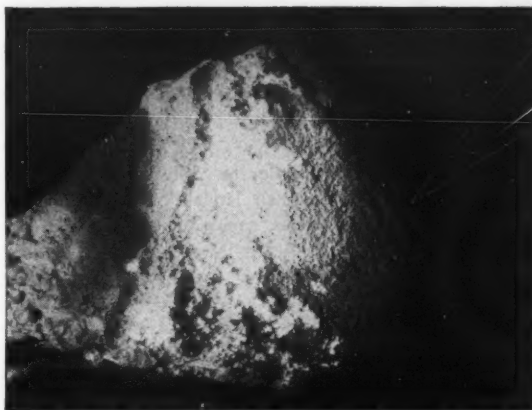
Illustrates manufacturing facilities and describes services offered

Company's manufacturing facilities and services are outlined in eight-page bulletin. Complete with drawings and photographs, bulletin describes design and construction of plants, distillation equipment, variety of trays and boiling caps, expansion joints, and vapor compression stills for purifying water. Services offered include process evaluation, engineering, procurement, construction, and assistance in plant start-up.

Bul "Engineering and Manufacturing" is issued by Badger Manufacturing Company, Dept. CP, 230 Bent Street, Cambridge 41, Mass. When inquiring reader may simply specify CP 4729 on convenient Reader Service slip which is between pages two and three.

For a guide to processing ideas . . .

You'll find what you need in the handy Product Directory on pages 170 to 173. All products and processes are listed there.



TO IMPROVE QUALITY AND GAIN ECONOMY

Here is an example of today's top-level manufacturing efficiency:

With a *single pass* of the raw material through a Raymond Imp Mill Flash Drying System, you can get a finished end-product of

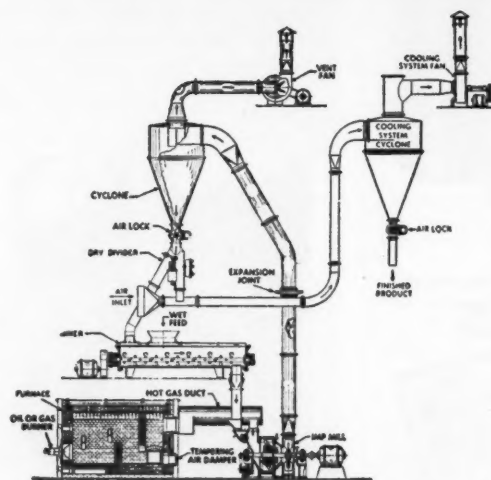
Specified particle size
Definite moisture content
Required final temperature

. . . a uniform quality, free-flowing material ready for bagging, shipping or bin storage. This modern method gives you a big leverage in production costs on several counts, namely—

All operations are simultaneous and combined in one unit of equipment. The rapid and continuous flow of material cuts down production time. No over-heating or deterioration of product occurs in the drying process. Operation is clean, dustless, automatic.

Chemicals, pigments, foods, industrial wastes, synthetic resins, filter-press products and a wide range of powdered materials can be handled at proven lower costs by Raymond Flash Drying. It will pay you to investigate.

For details of operation and typical applications of Raymond Flash Drying, write for Catalog No. 54-A.



Typical flow sheet of Raymond Imp Mill
with Flash Drying and Cooling System.

COMBUSTION ENGINEERING, INC.

1317 North Branch St.
Chicago 22, Illinois

Raymond Division

Sales Offices in
Principal Cities

When inquiring check CP 4730 on handy form, pgs. 2-3

SAFER WAY TO TRANSFER FLAMMABLE FLUIDS

Fast-Flo

DRUM PUMP

Does it
**SAFER
FASTER
CLEANER**



Old Way

Drums are placed on sides in special racks or supports, have molasses valves or spigots. Pails, troughs, or makeshift drain receptacles catch seepage. Disadvantages: "bad housekeeping" from dripping or leaking valves, danger of flash fires, maximum floor space needed, chances of injury in awkward drum handling positions.



New Way

Drums stand upright. Lightweight, economical, air-operated Fast-Flo pump dispenses any amount required. Advantages: no waste, no spilling, fire hazard minimized, less floor space required, no special racks, drums in safest position for injury-free handling.

Try this GRACO safety system in your own plant. The durable Fast-Flo pump provides double-action high-volume delivery with no pressurizing of drums. For example, it handles 18 gallons per minute of No. 20 oil. Full-size drums can be emptied in 3 minutes. One man sets up the 13-pound Fast-Flo easily. Pump is simply, strongly constructed for long service. Built to resist deterioration, delivers fluids cleaner. Fast-Flo handles most light fluids, will pay for itself quickly.

SEND FOR THIS NEW
**DRUM PUMP
IDEA BOOK**

Tells you where
and how this
pump can save
you time and
money. Write
for your
copy now!



GRACO *Fast-Flo* DRUM PUMP

GRAY COMPANY, INC., 12 Graco Square, Minneapolis 13, Minnesota

Regional Offices: New York, Philadelphia, Chicago, Detroit,
San Francisco, Atlanta

When inquiring check CP 4731 on handy form, pgs. 2-3

safety

kodak plays safe

with 378,000 cfm of potentially-explosive fumes

**Methyl alcohol and acetone vapors
teem in casting machines where
solvents are driven off to
produce film base**

A. P. HARMON, Supervisor of Instruments
Roll Coating Div., Kodak Park Works
Eastman Kodak Company
with BRUCE FADER, Associate Editor

In order to make good photographic film, Eastman Kodak has gone to an operation which requires first-class safety control. Knowing this, the film casting department at Kodak Park, Rochester, has evolved a monitoring system which actually takes control if it finds operating conditions drifting toward potential explosion hazards. In addition, instruments give plenty of warning so that operators can tell what is going wrong and where. Safety remains the responsibility of operating personnel and they know it. But the instrument system stands ready to take over if they cannot for any reason.

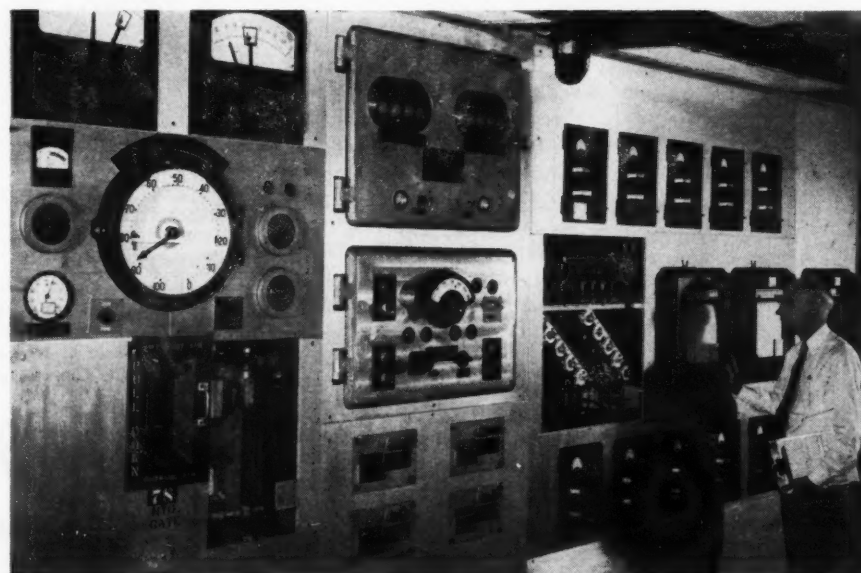
Reason behind this elaborate safety system

is the method of film casting. To make smooth transparent film base of uniform thickness, Eastman must start with a solution of cellulose acetate in acetone-methyl alcohol-chlorinated hydrocarbon solvent. Actual casting is done by running a thin film of this solution over smooth, warmed metal drums. Evaporation of solvent leaves a perfect plastic base for the many grades of film Eastman makes.

Since evaporated solvents are both dangerous to release and expensive, they are recovered. They pass through a refrigerated condenser (-85°F) where most of the solvent is collected as liquid. Solvent-free air is then warmed and returned to casting machine hoods.

At almost every step of the way, instruments watch solvent content of this air. As it comes off the evaporating solution on film casting drums a sample is picked up and sent to analyzing equipment. Air samples are also taken from several other stations within the machine. Sampling is made in air being returned from the solvent condenser.

Samples are run to separate gas analyzing cells. Several years ago this analysis was



Supervisor Harmon inspects record of solvent fume content — finds it well within limits



Ten thermal conductivity cells are mounted in panel center (top and bottom)

done by the Orsat method, but speed and reliability dictate a thermal conductivity method. Gas is burned in special cells continuously. Combustion products are passed through an electrical bridge circuit which measures thermal conductivity, hence CO_2 content.

Although one molecule of acetone produces three molecules of carbon dioxide upon combustion while one molecule of methyl alcohol produces only one, amount of carbon dioxide produced by the solvents used in the operation happens to conform nicely with actual explosive limit of the solvent. Output of thermal conductivity bridges drives multipoint indicating recorders equipped to alarm and shut down operations if necessary.

Similarly, loss of low temperature at solvent condenser sounds alarms and shuts down operation.

Each of 54 film casting machines (handling an average of 7,000 cfm of air) is equipped with a panel board of the sort shown. Six-point recorders are used to show percent of lower explosive limit at five key stations. Sixth point of each recorder is used to check continuous correct operation of recorder.

Routine maintenance calls for check of cells each week. Recorders are checked monthly.

In more than twenty years since any serious trouble has shown up in this operation, instrument system has continued to evolve. Operations today seldom result in warnings from monitoring setup. There have been no close calls at all in recent years. Typical of the sober safety thinking behind this record is one kink used by instrument maintenance men — alarm horns are always muted during check-outs of alarm circuits so that film casting operators seldom hear a false alarm.

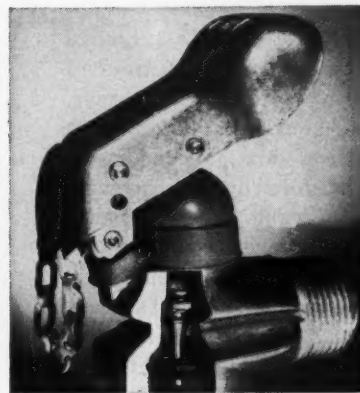
(Thermal conductivity and low temperature instruments for this installation were supplied by Leeds & Northrup Company, Dept. CP, 4901 Stenton Avenue, Philadelphia, Pa. Check CP 4732 on handy form, pages 2 and 3.)

(Some thermal conductivity cells are products of Charles Englehard, Inc., Dept. CP, 850 Passaic Ave., East Newark, N.J. . . . or for more information check CP 4732A on handy form, pages 2 and 3.)

Here's why Ansul extinguishers give you faster, more dependable fire protection!



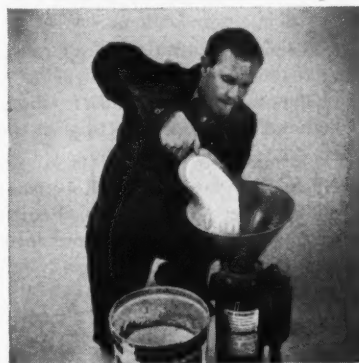
WEATHER-TIGHT NOZZLES made of aluminum and stainless steel, can't rust. Neoprene cap and oil-impregnated washers keep out moisture.



PUNCTURE PIN. In this aluminum housing a stainless steel pin pierces the gas cylinder that supplies the propellant power for the dry chemical.



PATENTED NOZZLES. Straight or fan stream, the hazard determines which is installed. An Ansul exclusive for more effective fire control.



FIELD RECHARGING. Just 4 minutes after a fire is extinguished your Ansul unit can be recharged, ready for action. No special tools are needed.

The pictures on this page tell half a story. The complete story includes Ansul's facilities for training your personnel in the science of fire control and prevention. Experience has taught us that *complete* fire protection demands *both*—fast, dependable equipment and trained personnel to man that equipment. Ansul can provide both. Get in touch with your local Ansul man, he has the complete story about *complete* fire protection.

Write Ansul for your copy of *New Fire Equipment Catalog*.



Call the ANSUL MAN!

Get in touch with your local Ansul man through the "yellow pages," or write direct to **ANSUL CHEMICAL COMPANY**, Fire Equipment Division, Dept. F-121, Marinette, Wisconsin.



READY for instant action under the most severe exposure conditions.

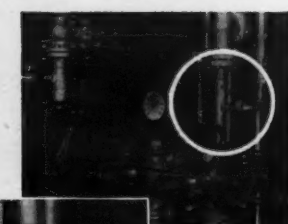
When inquiring check CP 4733 on handy form, pgs. 2-3

uty Heads pro-
cessor lines of
Texas conden-
very—pressure
no plant.



Equipment and personnel within a plant are protected from the hazards of overpressure in these vessels by BS&B Safety Heads.

BS&B Safety Heads Have Hundreds of Applications!



Here a BS&B Union Type Safety Head, with Manel rupture disc, is installed on a two-stage hydrogen compressor.



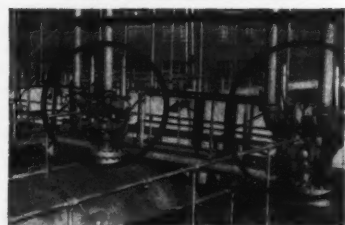
This BS&B Safety Head is mounted on the flare from a Pop Valve on an incoming gas line.

BS&B
Safety Heads



The variety of possible uses for BS&B Safety Heads is limited only by the number of different ways in which compressed air, gas or liquids—either bland or corrosive—are handled, processed or stored by our many manufacturing and processing industries! Wherever protection of a closed pressure system is required, there is a correct size and type of BS&B Safety Head to do the job! For detailed information, ask your BS&B Representative . . . or write to us direct.

THE "CIRCUIT-BREAKER" OF Any Pressured System



BS&B Combination Safety Head—Relief Valves protect 15,000 gallon butadiene storage tanks at an Akron, Ohio, rubber plant.

**BLACK
SIVALLS &
BRYSON, INC.**

Safety Head Division, Dept 2-M1
7500 East 12th St., Kansas City 26, Mo.



SAFETY

Explosion-proof electronic indicator gives continuous level readings in hazardous locations . . .

contains no moving parts that might clog or cause inaccuracies; is easily installed

Electronic level indicator in explosion-proof case is designed for installation in hazardous areas.

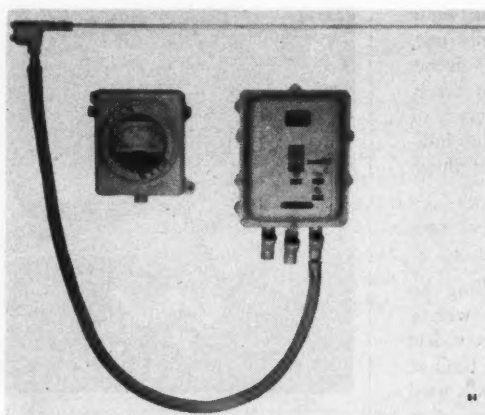
Indicators meet requirements of the National Electrical Code, Article 500, in the following classifications and groupings:

Class I (flammable gases or vapors)

- Group C — atmospheres containing ethyl ether vapor
- Group D — atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer, solvent vapors and natural gas

Class II (combustible dusts)

- Group E — atmospheres containing metal dust
- Group F — atmospheres containing carbon black, coal or coke dust
- Group G — atmospheres containing grain dust



Continuous level indicating equipment consists of measuring unit (right), standardizer indicator unit (center), and electrode assembly in explosion-proof housing with armored cable

Explosion-proof unit employs one-tube electronic unit for measuring mass or level of liquids, viscous fluids, powders and granular solids, regardless of whether they are conducting or non-conducting.

(Explosion-proof Telstor is a product of the Fielden Instrument Div., Robertshaw-Fulton Controls Co., Dept. CP, 2920 N. Fourth St., Philadelphia 33, Pa. . . . or for more information reader may simply check CP 4734 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 4735 . . . see information reader blank between pages 2 - 3.

Now THE NEW Schmieg CENTRI-MERGE Vertical ROTOR TYPE DUST and FUME Eliminators

FOR THE MOST Economical
COLLECTION and
ELIMINATION Efficiency

An important new Schmieg development to wash hazardous dust and fumes from the air in a rotating torrent of water, combining the cyclonic principle of dust separation and positive high pressure water action.



Available in Two Types

1. For wet collection and elimination only.
2. For primary dry and secondary wet collection and elimination, with built-in dry type pre-cleaner.

Capacities from
500 to 50,000
C.F.M.

Just a few of many reasons why a new Centri-Merge unit is your best investment in operating efficiency and economy:

- Low ratio of power to rated capacity
- High ratio of water circulated to air volume handled
- Independently driven low speed rotor and fan permit adjustments to load and operating conditions
- No slots or nozzles to restrict water action
- Automatic liquid level control
- Optional location of air inlet arm
- Material disposal by drag conveyor, hopper tank skim-off or manual clean-out
- Easy access to clean-out doors for cleaning while unit is in operation
- Bearings located out of liquid, fully enclosed, lubricated from outside.

Write or phone for Bulletin VU 8-53, describing the new Vertical Rotor Units. Then consult with Schmieg engineers to plan a Centri-Merge installation for maximum dust and fume collection and elimination efficiency in your plant.



When inquiring check CP 4736 on handy form, pgs. 2-3

Points out possible in large lot handling of ammonium nitrate

explains pressure
whether fire or

Immediately after the Coast Guard, which of shipping, issued transporting of all goods. To formulate basis for safeguard both public initiated by Coast Guard ammonium nitrate by firms chosen to work D. Little, Inc. Their nounced in a talk before Society in New York.

This is briefly what ammonium nitrate amounts of heat and house fires involving rial but explosions constant pressure, ammonium nitrate monia and nitric acid ing temperature rise explosion temperature is

It is believed that ammonium nitrate s Grandcamp, sufficient decomposition development that touched on

It has also been de Inc. that spontaneous perature can cause grade ammonium n

Safe limits of temp fire and explosions h Guard regulations hav

(Information from nium Nitrate and Nitrate Materials", C. Lothrop of Arth 30 Memorial Drive, 4737 on handy form,

Describes protection of aluminized asbes

Leaflet of six p aluminized asbes alls for fire fight

"New for the Fi trial Safety Spec Chestnut St., Per handy form, pages

SAFETY

Points out possible hazards in large lot handling of ammonium nitrate . . .

explains pressure as a factor determining whether fire or explosion will result

Immediately after the Texas City disaster, U.S. Coast Guard, which is responsible for regulation of shipping, issued strict instructions for marine transporting of all grades of ammonium nitrate.

To formulate basis for improved regulations and to safeguard both public and producers, research was initiated by Coast Guard on decomposition of ammonium nitrate by heat and fire. One of the firms chosen to work on this problem was Arthur D. Little, Inc. Their findings were recently announced in a talk before the American Chemical Society in New York.

This is briefly what they discovered. In a fire, ammonium nitrate decomposes giving off large amounts of heat and gas. There have been warehouse fires involving large quantities of the material but explosions only in ships. The reason—at constant pressure, reaction takes place in which ammonium nitrate disassociates into gaseous ammonia and nitric acid. Reaction absorbs heat, limiting temperature rise caused by fire and hence explosion temperature is not reached.

It is believed that from mass of 40,000 bags of ammonium nitrate stowed in the hold of the S.S. Grandcamp, sufficient pressure for products of decomposition developed locally to produce explosion that touched off entire cargo.

It has also been determined at Arthur D. Little, Inc. that spontaneous combustion at excessive temperature can cause a fire in FGAN (fertilizer grade ammonium nitrate.)

Safe limits of temperature and pressure to avoid fire and explosions have been determined and Coast Guard regulations have been simplified.

(Information from "Thermal Hazard in Ammonium Nitrate and High-Percentage Ammonium Nitrate Materials", by R. M. Hainer and Warren C. Lothrop of Arthur D. Little, Inc., Dept. CP, 30 Memorial Drive, Cambridge, Mass. Check CP 4737 on handy form, pages 2 and 3.)

Describes protective clothing of aluminized asbestos

Leaflet of six pages describes and illustrates aluminized asbestos hoods, gloves, and coveralls for fire fighting and rescue work.

"New for the Fire Fighter" is issued by Industrial Safety Specialties Co., Dept. CP, 8th & Chestnut St., Perkasi, Pa. Check CP 4738 on handy form, pages 2 and 3.



ALL TYPES...ANY CLASS FIRE!

Since different fire hazards require different types of fire extinguishers, PYRENE—C-O-TWO manufactures all types . . . the finest and most complete line on the market today.

When doing business with PYRENE—C-O-TWO, you receive unbiased advice on what is best for your particular fire hazards, whether class A, B or C.

Also, there is a well-rounded sales engineering organization having nation-wide representation to render top quality service wherever you're located.

Don't take unnecessary chances . . . the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts now!



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Sales and Service in the Principal Cities of United States and Canada

COMPLETE FIRE PROTECTION

portable fire extinguishers . . . built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM



When inquiring check CP 4739 on handy form, pgs. 2-3

**Folder describes 11 books
on safety subjects**

Synopses of 11 new publications for safety men are presented in accordion-fold leaflet. Books described in leaflet cover such fields as safety devices in chemical plants, accident prevention in construction, safety in quarry operations, and safety programs and ideas in general.

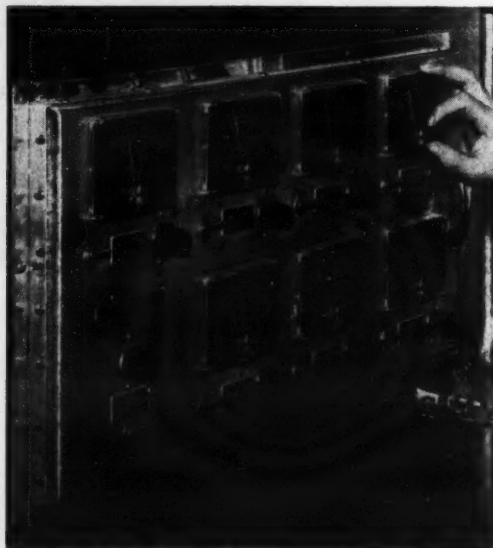
"Publications for Safetymen" bulletin is issued by National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. When inquiring specify CP 4740 on handy form, pages 2 and 3.

**Prevents fire, explosions
and bearing freeze-up
in pipeline . . .**

monitors all critical bearings and shuts down station in case of temperature rise

Instrument has been developed which monitors all critical bearings and shuts down pipeline pumping stations in case of temperature rise.

One of these instruments is in use at the Twinsburg, Ohio pipeline station. This station is part of a network of pipelines connecting refineries in



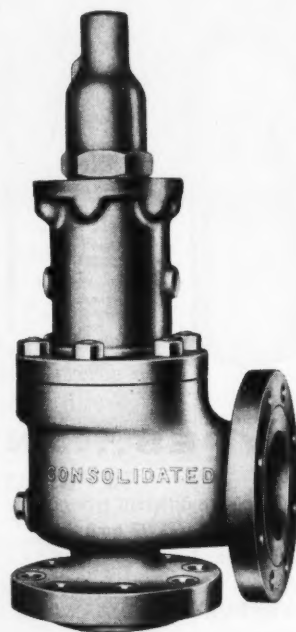
Guards critical bearings in unattended pipeline pumping station

Northern Ohio. Station is automatic and runs unattended. All instruments and controls are in a separate building 300 ft from pump house to keep them out of range of possible explosive atmosphere.

Instrument utilizes thermocouples attached to each

NOW... CONSOLIDATED SAFETY RELIEF VALVES

in economical **"2 in 1"** design



Peak performance . . . positive valve action assured . . . even where discharge lines are long, or low "superimposed" back pressure exists in the relieving system.

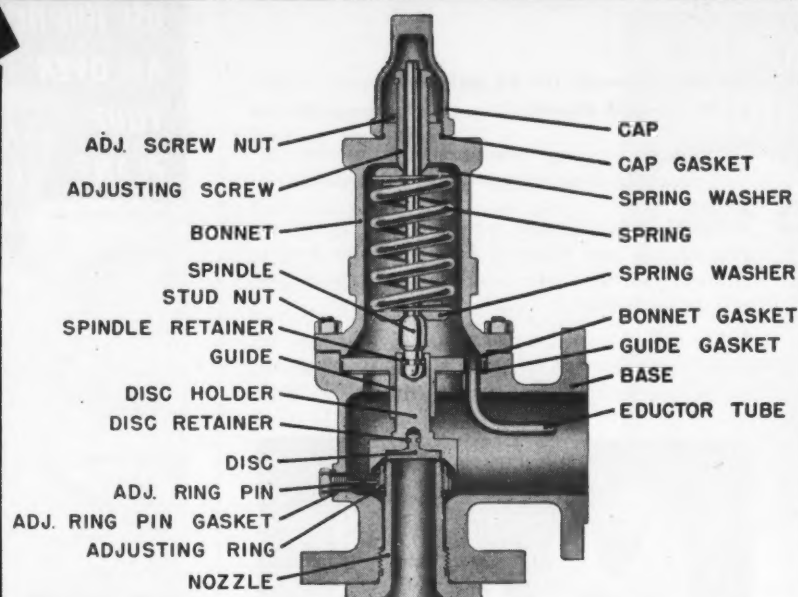
"Two-In-One" design, improved performance . . . the new Consolidated Safety Relief Valve is the result of over 4,000 flow tests in 5 years at West Edmond, Oklahoma. At the A.S.M.E.-approved testing station there, natural gas is available in flow capacities up to 35,000 cfm and pressures up to 500 psig. The A.S.M.E.-approved conditions, apparatus, and procedures permitted Consolidated engineers to test-develop and prove the full range of valve sizes and pressures in both Standard and Bellows designs.

Interchangeability is so highly developed that the majority of Consolidated Standard Valves can be converted to the Bellows design, in the field, simply by installing the bellows. Each type has fewer functional parts than other comparable safety relief valves. Standardization of inlet and outlet center-to-face dimensions permits interchangeability with a large proportion of the valves of other manufacturers. Incorporated is an optically-ground flat seating surface that contributes to easier, more economical maintenance.

You can have the absolute protection and real economy of the thoroughly tried and proved Consolidated Safety Relief Valves for your plant today. Both Standard and Bellows types are available in sizes and pressures to meet requirements of the most advanced processing facilities. Write for full details. Ask for Catalog 1900.

CONSOLIDATED SAFETY RELIEF VALVES

STANDARD VALVE has an eductor tube that holds the pressure in the valve bonnet to approximately atmospheric pressure; thus only the force of the spring controls the valve. Valve action is improved and stabilized... a new high in operational dependability is assured. Even under repeated popping of the valve, set pressure and blowdown are consistent. The valve will open to full capacity at 3% overpressure regardless of the position of the adjusting ring.



bearing. Wires from thermocouples are buried in conduit between the two buildings. Temperatures are shown directly on the meter scale. Safety trip point is set just above the normal operating temperatures. Contacts in the instrument's meter-relay close in case of temperature rise and shut down station. Other controls manipulate valves to immediately bypass this station. Shutdown is signaled to central control station.

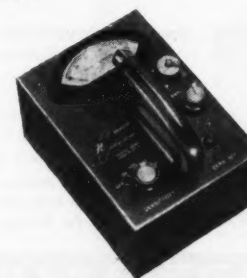
Variations of these meter-relays have been used to detect radiation, light and heat and changes in voltage, current, speed, pressure and other functions. In microwave relay stations which beam television programs across parts of the country, these meter-relays monitor the program and detect loss of power.

(Simplytrol Polypoint is a product of the Assembly Products, Inc., Dept. CP, P.O. Box 191, Chagrin Falls, Ohio... or for more information check CP 4742 on handy form which is located between pages two and three.)

Low level contaminations resulting from alpha, beta, gamma rays detected by instrument

Uses: For surface measurement of any low level alpha, beta, and gamma contamination (C-14, I-131, S-35, radium, etc.)

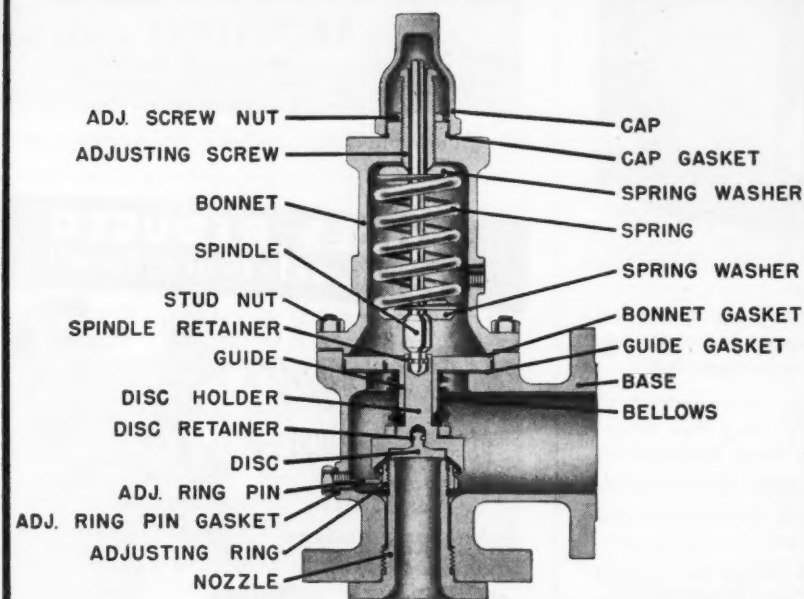
Features: All batteries are contained in compact plug-in unit which may be easily removed through door in side of case. Handle includes neon flasher which indicates operation. When instrument is placed on flat surface, thin window at bottom is only 7/32" above surface to be monitored.



Description: Instrument features 40 cu in ion chamber at bottom of case with 0.5 mg/cm² rubber hydrochloride window protected by stainless steel grill.

Three alpha ranges are provided covering any count rate from 0 to 12,000 counts per minute. These ranges correspond to radium gamma ranges of approximately 0 to 18 mr per hr. It will detect alphas with energies as low as 1 mev or betas with energies as low as 15 kev.

(Model 2582 "Samson" is manufactured by Nuclear, Chicago, Dept. CP, 229 W. Erie St., Chicago, Ill. ... or for more information check CP 4743 on handy form which is located between pages two and three.)



BELLOWS VALVE is like the Standard but has a durable, two-ply stainless steel sealing bellows which effectively isolates from the valve's working parts any contaminants, corrosion, or viscous fluids. The bellows is balanced with the seating surface: set pressure of the valve is not affected by back pressure, whether constant or variable. Consequently, smaller discharge piping can be used, thus reducing the cost of pressure-relieving systems.

Certified and Approved

Both Standard and Bellows Valves are approved under A.P.I.-A.S.M.E. Unfired Pressure Vessel Codes, A.S.M.E. Unfired Pressure Vessel Code and are certified by the National Board of Boiler and Pressure Vessel Inspectors.

A PRODUCT OF MANNING, MAXWELL & MOORE, INC.

TULSA, OKLAHOMA

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'ASHCROFT' GAUGES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Conn. 'HANCOCK' VALVES, Watertown, Mass. AIRCRAFT CONTROL PRODUCTS, Danbury & Stratford, Conn. and Inglewood, Calif. "SHAW BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.

When inquiring check CP 4741 on handy form, pgs. 2-3

EXPUL GASES, EXPLOSIVE FUMES AND DUSTS

with Propellair "CS" Fans

Widely used under
corrosive fume
conditions

HIGH
EFFICIENCY

LOW
MAINTENANCE

LONG
LIFE

■ **Propellair** "CS" Fans are rugged, heavy-duty units for duct installation. The cast aluminum alloy airfoil propeller is housed in a welded heavy-gauge steel duct section and belt guard with internal bearing assembly.

Robbins & Myers **All-Weather Motor** located outside airstream. Sizes 20" to 60", with certified air deliveries of 3750 to 85,000 c.f.m. Available with corrosion and abrasion-resisting finishes and with ventilated bearings suitable for operation in high temperatures.



Simplified Installation
Propellair "CS" Fans are built to fit standard duct sizes without the need of elbows. The fan drum has front and rear flanges drilled for easy mounting into duct system.
Our engineers are at your service for fan selection and application advice. Write for Bulletin 650C.



Man Cooler



Direct Drive



Sky-Blast



Vaneaxial



Extended Shaft

When inquiring check CP 4744 on handy form, pgs. 2-3

134

SAFETY

**Provides storage for 45 gal
of flammable liquids . . .**

permits working quantities of flammables to remain in room convenient to work areas

Designed in accordance with National Board of Underwriters and National Fire Protection Assoc., cabinet provides safe over-night or week-end storage of flammable liquids within plant.

Cabinet is of steel construction with walls of 18 gage terne plate and air space of 1½" between all walls. It has three steel shelves and double door



for unobstructed access to every can. Doors are equipped with spark-proof 3-point lock with key. All closure contact points are non-sparking.

Door sill is raised two inches above bottom of cabinet. The words "Flammable. Keep Fire Away" are stenciled in large letters on doors. Provision has been made for vapor venting when this is desired.

Overall dimensions are 43" wide x 65" high x 18" deep. Net weight is 380 lb. Finish is machine grey.

(Storage cabinet is a product of the Protectoseal Company, Department CP, 1920 South Western Avenue, Chicago, Illinois . . . or for additional information about manufacturer's product, reader may simply check CP 4745 on the convenient Reader Service slip which is located between pages two and three.)

Have a safety problem . . . ?

the handy Product Directory (pages 170 to 173 in this issue) is your guide to equipment and ideas which may suit your needs.

USE THIS NEW SAFETY MATERIAL ALL OVER YOUR PLANT

Work platforms



Flooring



Gutter Covers



Partitions



Safety
GRIP-STRUT
Pat. Pending

NON-SKID—RUGGED—LOW COST

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe.

Write today for new catalog showing loadings and methods of easy application in your plant.

Distributors in all principal cities.

GRIP-STRUT division
THE GLOBE COMPANY

Manufacturers since 1914

4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 4746 on handy form, pgs. 2-3

PRICES REDUCED to an all-time low!

WORKLON®
**ACID & CHEMICAL
RESISTANT
INDUSTRIAL APPAREL**

Du Pont • Union Carbide
ORLON® OR **DYNEL®**

- ★ ACID, CHEMICAL AND ABRASION RESISTANT!
- ★ U.S. NAVY SAYS: OUTWEARS COTTON 50 TO 1
- ★ LAUNDERS AND DRIES QUICKLY — NO IRONING!

Save up to
93%

**NOW
READY!
New, Free
CATALOG**

*Du Pont Orlon acrylic fiber

WORKLON, INC. Dept. C1 253 West 28th St., New York 1
FREE! Rush WORKLON's new, fully illustrated catalog of
ORLON, DYNEL WORK CLOTHES.

Form Name _____
Address _____
City _____ State _____
Attention of _____ Dept. _____

When inquiring check CP 4747 on handy form, pgs. 2-3

CHEMICAL PROCESSING

J. E.
GREENV

PLANT
METAL
WATER

When inq

CHOO
TO M



Only Ba
sure you
A stand
three sa
rubber-c
baskets;
extras a
into eve

BALLY

For
tr
represent
in prin

When in

JANUA

J. E. SIRRINE CO.

GREENVILLE • SOUTH CAROLINA

Engineers
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 4748 on handy form, pgs. 2-3

CHOOSE FROM 115 MODELS TO MEET YOUR EXACT NEEDS!



Only Ballymore ROLL-OR-GRIP all-welded-steel ladders assure you of just the right portable safety stair for each need. A standard size range from one to twelve steps; a choice of three safety treads (expanded steel lath, steel grip-strut, or rubber-clad steel plate); optional hinged shelves or removable baskets; and a wide choice of widths within each size—these extras add convenience to the superior safety features built into every Ballymore—the original—safety-step ladder.

BALLYMORE Safety-Step LADDERS

Factory-trained representatives in principal cities	To: BALLYMORE COMPANY, WAYNE 10, PA.	
	<input type="checkbox"/> Forward free catalog of Safety-Step Ladders. <input type="checkbox"/> Have representative call to survey my safety-ladder needs.	
	Name _____	Title _____
	Company _____	
	Address _____	

When inquiring check CP 4749 on handy form, pgs. 2-3

JANUARY, 1955

SAFETY

Offers courses on subjects of radiological safety and air pollution

In cooperation with the College of Engineering, two courses are being offered by Institute of Industrial Medicine of NYU Post-Graduate Medical School.

From Jan 10 to 21, daily morning and afternoon sessions will be held on subject of Radiological Safety. All phases of use and proper handling of radiological instruments and materials will be covered. Tuition is \$50.

From Feb 10 to May 26, classes will meet once a week (Thursday 4-6 pm) to study problem of Air Pollution. Subject matter will include physical, chemical and physiological properties of pollutants, case reports, techniques of sampling and measurement, review of equipment for air cleaning, and study of governmental regulations on subject. Tuition is \$60.

Both courses will be held at Medical Science Bldg., 550 First Ave.

(Applications for admission should be made to Office of the Dean, NYU Post-Graduate Medical School, 550 First Ave., New York 16, N.Y. or phone Oregon 9-3200 . . . for more information check CP 4750 on handy form, pages 2 and 3.)

Gas analyzers, alarms described in brochure

Line of combustible gas analyzers and alarms are described in 20-page brochure. Publication contains part-by-part descriptions of components for manufacturer's analyzers. Actual installations in varied industries are fully covered, and method of designing combustible gas alarm system is shown schematically.

Bul No. 0703-3 is issued by Mine Safety Appliances Co., Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. When inquiring reader may simply specify CP 4751 on handy form, pages 2 and 3.

• CLOTH FOR HOT ACID FILTRATION • CLOTH FOR HOT DUST COLLECTION

USE CLOTH MADE FROM
"ORLON"®



This cloth is available in standard width of 38" from stock. We will weave any desired width from 26" through 72" to your order in quantities as low as 100 linear yards.

We have a background of over Forty Years in weaving Industrial Fabrics . . . we weave all of our own Synthetic Fiber Filter Fabrics. We have the "know how" necessary to produce uniform Filter Cloth with outstandingly superior operating characteristics.

Literature and pilot test sample available on request.

We also weave filter cloth of VINCELt, SARAN, DYNEL, NYLON, VINYON N**, GLASS, DACRONt, TEFLON***, POLY-ETHYLENE.

. . . for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, chemical resistant, high burst factor, abrasion resistant and crease resistant. Send for a test sample.

*TM for duPont Acrylic Fiber.
**TM—NFM Reg. U. S. Pat. Off.
***TM UC&C Co.
****TM for duPont Polyester Fiber
*****TM for duPont Tetrafluorethylene Fiber

If high operating temperatures are your problem we suggest you try this NFM cloth made from ORLON® Acrylic Fiber. Here are some of its values:

No loss of strength after 32 days exposure to air at 257° F.



Shrinkage not more than 2 1/2 % in water at 212° F.



Good resistance to hot mineral acids, weak alkalis, common solvents, oils, greases, neutral salts, most acid salts and chlorine.



Weavers of Industrial Filter Media for over Forty Years
The National Filter Media Corp.
General Offices & Mills: New Haven 14, Conn.
Western Office & Factory: Salt Lake City 1, Utah

Sales Offices—Representatives

Chicago, Ill. Cincinnati, Ohio Houston, Texas Oslo, Norway Johannesburg, South Africa
2627 West 19th St. Roselawn Center Bldg. 1503 Hadley Street Nicolai Friis Edward L. Bateman

When inquiring check CP 4752 on handy form, pgs. 2-3

What every reader of . . .

CHEMICAL PROCESSING

should know!

*It's a Snap
to Apply*



BALDWIN-HILL

MONO-KOVER

ONE-PIECE PIPE INSULATION

- Extra Light Density
- Easily Cut and Fitted
- Six Foot Lengths
- Resilient, Flexible
- Won't Break or Crumble
- Easy to Paint
- Highly Efficient
- No Coarse Fibers
- Takes Rough Handling
- Easily Nested
- Non-Corrosive
- Won't Rot, Decay, Mold
- Lower Applied Cost
- Factory Applied Vapor Barrier

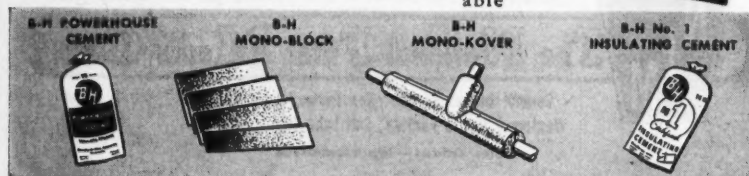
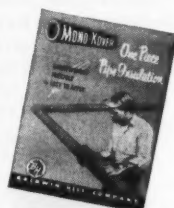


Baldwin-Hill COMPANY

401 BREUNIG AVE., TRENTON, N. J.

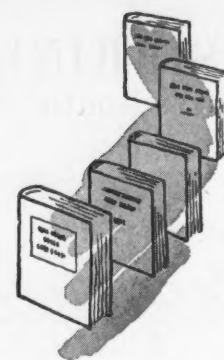
Kalamazoo, Mich. • Huntington, Ind. • Temple, Tex.

Send for bulletin with data on how to apply, properties, selection help, sizes and thicknesses available



When inquiring check CP 4753 on handy form, pgs. 2-3

Recent Books



Molecular Theory of Gases and Liquids

Reviewed by I. AMDUR
Professor of Physical Chemistry
Massachusetts Institute of Technology

Three authors, Joseph O. Hirschfelder, Charles F. Curtiss, and R. Byron Bird, all of whom have previously published original work in thermodynamics, statistical mechanics, and kinetic theory, have collaborated to produce a scholarly volume of more than 1200 pages that treats the properties of gases and liquids in fundamental, rather than empirical, fashion.

The book divides the properties of gases and liquids into equilibrium properties (such as equation of state, Joule-Thomson coefficient, and surface tension), and nonequilibrium properties (such as viscosity, diffusion, and thermal conductivity). Both groups are interrelated by using statistical mechanics to obtain expressions for such properties in terms of molecular properties and intermolecular forces.

There are fourteen chapters, the first of which containing introduction and background information. Chapters 2-6 (Part I) deal with equilibrium properties and treat the equation of state of gases at low, moderate, and high densities, the equation of state of liquids, vapor-liquid equilibria and critical phenomena. Classical and quantum treatments are presented. Chapters 7-11 (Part II) discuss the nonequilibrium properties. They present classical and quantum treatments of dilute and dense gases, and liquids.

Chapter 11 is of particular interest. It applies the results of the preceding chapters to the hydrodynamics of fluids and discusses such topics as propagation of sound, flame, and shock waves, and the theory of detonations.

Chapters 12-14 (Part III), which deal with intermolecular forces, discuss their electromagnetic origin, types of forces, and methods of obtaining information about them from experiment, and the calculation of intermolecular forces.

The authors have made a significant contribution by repeated emphasis of the importance of the role of intermolecular forces in gas and liquid properties. They have written a treatise that should be an extremely valuable reference for any serious worker in thermodynamics, statistical mechanics or kinetic theory.

To obtain "Molecular Theory of Gases and Liquids" remit \$20 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 4754 on handy form, pages 2 and 3.

Graphics in Engineering and Science

Reviewed by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

Prominent among the important technical books of 1954 is "Graphics in Engineering and Science" by A. S. Levens, veteran teacher, designer, and engineering consultant. Like Gaul, this 696-page volume is divided into three parts: fundamentals and application of orthogonal projection, which includes valuable material on developments, visibility, intersections, and pictorial drawing; technical drafting practices, devoted to sections, conventions, threads, fasteners, cams, gears, and dimensioning; and graphical solutions and computations, which deals competently if not completely with graphical methods, empirical equations, nomography, and graphical calculus.

**reviews of current technical and reference works
... summarized for you by the CP staff,
working with authorities in the field**

Designed for engineers of all interests, rather than for professional draftsmen, the book contains, in Part 1, all that anyone needs to know about descriptive geometry; in Part 2, sound drafting practice; and in Part 3, the essentials of the most elementary parts of curve fitting and alignment charts. Users of "Graphics" will be interested in learning that a companion workbook, entitled "Problem Sheets", (11 x 17", perforated, paper-bound) is also available from the same publishers, John Wiley and Sons, Inc.

Amplified with 261 problems, five appendices, a bibliography, and a good index, the book is well adapted to work in the classroom and to individual study without benefit of instructor. The author and publisher have something of which to be proud!

To obtain "Graphics in Engineering and Science" remit \$7 direct to John Wiley and Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 4755 on handy form, between pages two and three.

Physical Chemistry

(Staff Review)

Debye's foreword to this volume describes it well: "This new book of Rutgers covers its subject very completely. Some parts of it are clearly Physical Chemistry in the classical sense of the word, others might perhaps be more aptly described by calling them Chemical Physics . . . The book covers the range: from the classical laws of thermodynamics to their statistical interpretation; from the principles of Newtonian mechanics to those of the quantum theory."

It is neither a book for the neophyte nor the sort handy for a quick review. But it makes a compact presentation of all currently important theoretical material in its field. Especially important is the fact that though based solidly on mathematics, this volume does attempt to interpret equations. Most of its mathematical derivations are interlarded with clear explanations, cross references, notes about significance of mathematical terms.

Two subjects not usually covered in physical

chemistry texts are included — a 77-page chapter on the atomic nucleus and an appendix (26 pages) dealing with physical chemistry of high polymers. Bibliography is selective.

To obtain "Physical Chemistry," by A. J. Rutgers, remit \$8.50 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N.Y. When inquiring specify CP 4756 on handy form, pages 2 and 3.

Manual For Plastic Welding

Reviewed by RALPH L. MONDANO

Raytheon Manufacturing Company

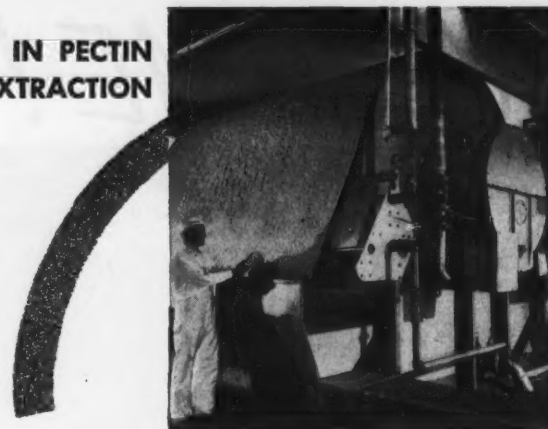
Since the inception of plastic welding, several papers have been devoted to techniques. In "Manual for Plastics Welding, Vol. II for Polyethylene," Haim and Neuman have given the reader as complete and succinct account of the subject as one can find.

The perspective of the plastics welder, for whom this 128-page book was intended, makes it a worthwhile contribution toward expansion of the use of polyethylene. The small amount of technical information contained in the book can prove stimulating to the reader without boring him. The various available forms of polyethylene as well as the special equipment required to manufacture them are discussed. Detailed coverage of actual welding and equipment, coupled with the very excellent pictures and illustrations, aids the welder in interpreting the contents of the book. Of exceptional interest are the practicable methods for cutting, marking, and positioning the work.

Possible pitfalls and hints for handling polyethylene pipe lines are presented simply, in a manner similar to those found in installation and company repair manuals, and are thus easily understood and well-received by the tradesman. The short discussion on the selection of the proper man for the plastic welding job reveals the familiarity of the authors with their subject.

To obtain "Manual for Plastic Welding, Vol. II," remit \$6.00 direct to Industrial Publishing Co., Dept. CP, 1240 Ontario St., Cleveland 13, Ohio. When inquiring specify CP 4757 on handy form, pages two and three.

IN PECTIN EXTRACTION



One FEinc Continuous Filter Replaces Two Presses and Six Men

Looking at this clean, quiet picture, you'd never know this filtration job was formerly a hot, steamy mess, requiring six men per shift to load and unload wet, acid-laden press blankets, racks and press cars of two stop-and-go hydraulic presses.

Now it's a smooth-running, really continuous filtration operation, on this big FEinc String Discharge Filter. Only one operator is now required, with very little to do except watch the cake roll off hour after hour. Even the daily washup takes little time and effort.

Pectin recovery is reported to be as good as formerly. Losses due to leakage and spillage have been eliminated. The dynel cloth on this filter lasts more than a year . . . a substantial saving in the cost of filter cloth.

The pulp is lifted from the filter by continuous orlon strings . . . the famous FEinc String Discharge which successfully handles all types of cakes ranging from thin slimes to thick heavy sludges. There's no smearing, blinding or plugging of the fabric, and no loss due to "blow-back."

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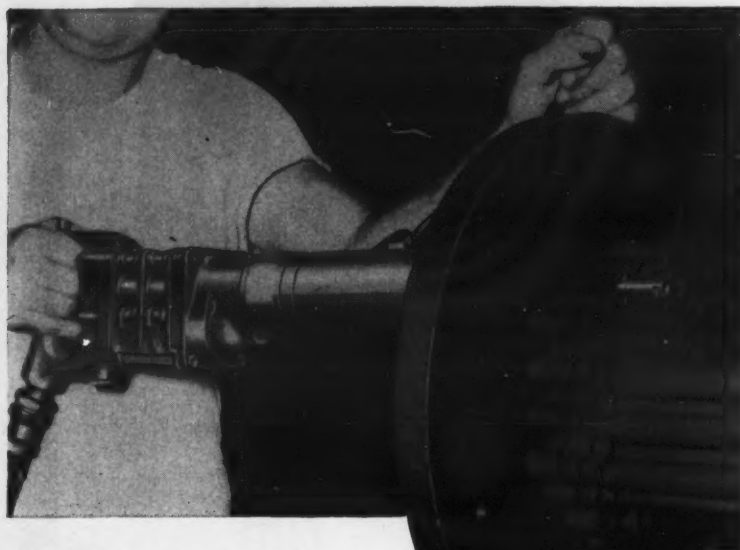
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When inquiring check CP 4758 on handy form, pgs. 2-3

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engineering and maintenance

Dollars are lost when processing towers are off-stream, so Standard Oil Co. of Ohio uses method which —

saves five weeks in tower-cleaning time

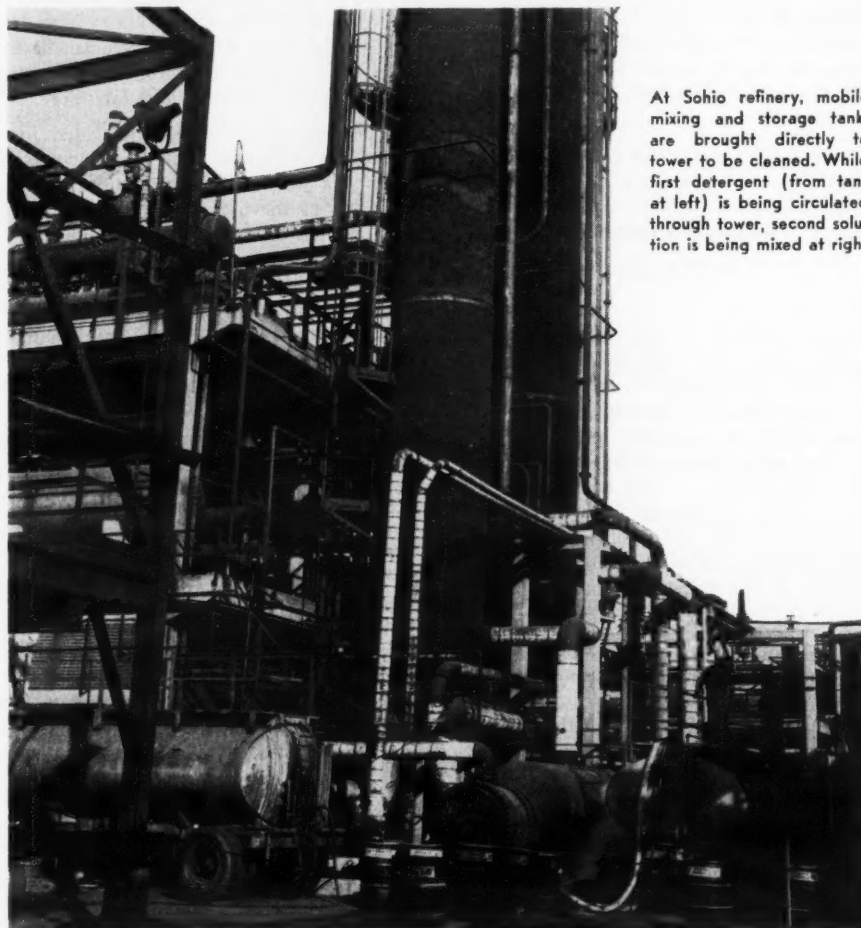
One week instead of six completes job, with mobile mixing tanks and effective circulation of chemical detergents making operation almost automatic

Problem: Cleaning three processing towers — debutanizer, depropanizer, and absorber — represented six weeks work when done manually at Standard Oil Co. of Ohio's No. 1 refinery in Cleveland. It

also represented six weeks off-stream for the towers and a consequent dollar loss.

Solution: To save costly downtime, Sohio decided to utilize a chemical circulation method for cleaning towers. This is accomplished by a specialized detergent (or detergents), capable of making tower deposits soluble, which is circulated through tower for as long as necessary to effect soil removal.

In cleaning the Ohio towers, soil samples were examined, and the proper detergent



At Sohio refinery, mobile mixing and storage tanks are brought directly to tower to be cleaned. While first detergent (from tank at left) is being circulated through tower, second solution is being mixed at right

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recommended. Actually, two were chosen. The first detergent — a blend of alkaline salts, containing a moderate amount of mixed base soaps — was chosen for its ability to emulsify oil binders.

A mobile tank for mixing and holding detergent solution, and pumps and lines for circulating it, is moved to tower location. A solution of the first detergent is prepared and heated, by steam, to 200°F. Then it is pumped to a tower and circulated from top to bottom for about seven hours. At the end of this time, about 100 gallons of solution is drained off. This "discard" contains bulk of soil removed from tower. Remainder of solution is returned to its tank and tower is flushed with water.

Meanwhile, in another mobile tank, the second detergent — an acidic-type cleaner, inhibited to provide protection to metals — is being mixed. It was chosen for its effectiveness in attacking the hard carbon and scale below the surface oils in the towers.

Just as soon as first detergent has been drained and the tower rinsed, the second hot solution is pumped into the tower and circulated for eight hours. A portion of this solution is then drained and the remainder returns to its tank. The tower again is flushed with water.

The same procedure is repeated for each of the other towers, until all three are clean. Concluding step is thorough rinsing of all towers.

Results: This final rinsing is complete just a week after the cleaning operation starts. Thus, chemical circulation methods save five weeks in the tower-cleaning operation. Use of the mobile tanks plus the detergents makes the operation almost automatic. Chemical cleaning is considered more thorough than manual method, and towers needn't be dismantled.

(Photo courtesy G. W. Hanneken, Standard Oil Co., Ohio.)

(Chemical circulation method was accomplished using Compositions No. 19 and 88, products of Oakite Products, Inc., Dept. CP, 19 Rector St., New York 6, N. Y. Check CP 4760, pages 2 and 3.)

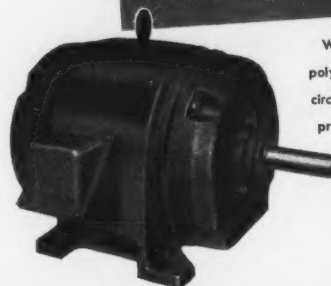
Tabulates stock roller chains and sprockets

Catalog of 66 pages covers line of stock roller chains and sprockets. Line includes minimum bore sprockets for reboring as well as finished bore and Taper-lock bushed sprockets which are ready for use.

Cat 754 is available from Diamond Chain Company, Inc., Dept. CP, 420 Kentucky Ave., Indianapolis 7, Ind. When inquiring specify CP 4761 on handy form, pages 2 and 3.

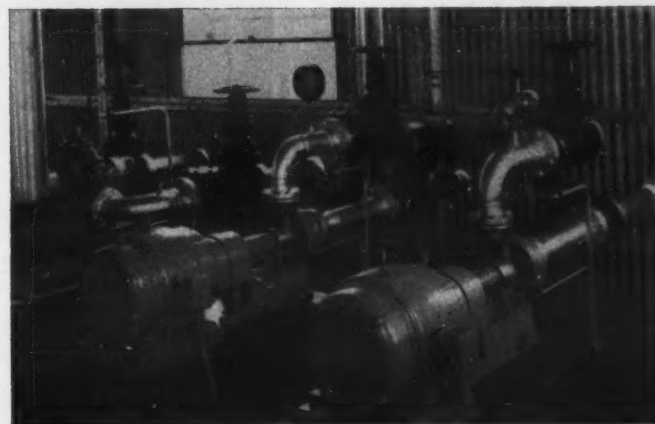
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ELECTRIC MOTORS
...the choice of leaders
in industry

PUMPS



Wagner 15 hp
Splash-proof
polyphase motors
driving water
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in Louisiana.

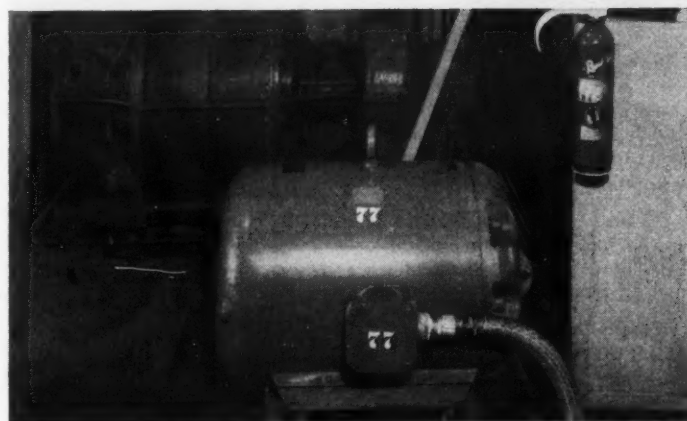
**You can depend on Wagner Motors
to furnish *PLENTY OF POWER*
for compressors, pumps or blowers**



BLOWERS



Wagner 40 hp Explosion-
proof motor driving a blower
to draw grain into a hopper
at a Southern brewery.



Motors that drive compressors, pumps and blowers need plenty of electrical and mechanical stamina to hold up under the hard, steady grind demanded by these applications.

Selecting the right motor for such equipment is not a problem of procuring specially built motors, but of choosing a standard Wagner Motor suited to the job. Wagner Motors are diversified in design and can be readily adapted to a wide range

of compressor, pump and blower applications. Improve the performance of your equipment by choosing Wagner Motors to power your compressors, pumps and blowers.

Bulletin MU-185 gives information on the complete line. Let a skilled Wagner engineer discuss your motor needs with you. Just call the nearest of our 32 branch offices, or write us.



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AUTOMOTIVE
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AIR AND HYDRAULIC

When inquiring check CP 4762 on handy form, pgs. 2-3

What it takes to make a 3000 Degree Refractory Concrete



Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

Q. When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?

A. No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.

Q. Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?

A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water

and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

Q. Then you have a grog, a binder and a method of putting them together. Which is most important?

A. You can't say that any one is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.

Q. And now, what about the binder?

A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the pre-

firing of the binder to produce stable compounds.

Q. Just how important is the manufacturing or "blending" of the grog and the binder?

A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, pre-firing temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

Q. These factors you've discussed must add up to some specific advantages of Kaocast. What are they?

A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.

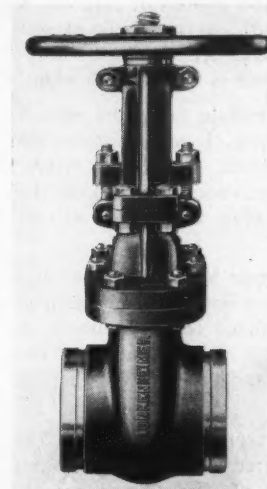
ENGINEERING AND MAINTENANCE

Pipe fitting, adapters eliminated by grooved-end gate valves . . .

simple two-bolt collar cuts hookup labor costs

Uses: In various piping installations, especially in the mining and oil industries, where grooved-end pipe couplings are utilized.

Features: Reductions in labor costs have been reported since simple two-bolt collar on valve eliminates time-consuming pipe fitting. Grooved-end couplings also eliminate necessity for using grooved-end adapters to connect grooved-end or flanged-end valves in lines where grooved-end pipe and couplings are used to obtain greater flexibility.



200 and 225 lb WOG in
various valve models are
available

Description:

Iron body, bronze-mounted gate valves (200 lb WOG) with grooved ends are available in 2½, 3, 4, 6, and 8" sizes. Non-rising stem, outside yoke and screw valve models are offered. The 225 lb WOG "King-

clip", inside screw and rising stem model, is available in the 2" size.

(Grooved-end gate valves are products of The Lunkenheimer Co., Dept. CP, PO Box 360 C, Cincinnati, Ohio . . . or for more information concerning manufacturer's product, reader may simply check CP 4764 on the convenient Reader Service slip which is located between pages 2 and 3.)

Air laden with dust or chemicals doesn't affect buildings covered with vinyl-base coating . . .

applied by brush or spray, material dries to touch in 20 minutes

Uses: Coating surfaces such as concrete, brick, cinder block, plaster, asbestos shingles, or steel surfaces.

Features: Material, based on Bakelite vinyl resins, forms a tough, smooth, and resilient skin. It withstands weathering and abrasion, resists moisture, chipping and peeling. Particularly useful for industrial buildings, coating also resists constant wear and air laden with dust, salt water or chemicals.

When inquiring check CP 4763 on handy form, pgs. 2-3



Coating leaves smooth, attractive finish

Description: Carlon coating for masonry and steel can be applied by spray, brush, or roller. First coat of material flows into and seals all cracks and pores. Second coat increases resistance to abrasion. Little dirt adheres to attractive finish. Coating dries to touch in twenty minutes. It is available in white, black, and aluminum, and 20 other colors.

(Coating for masonry is a product of Vimasco Corporation, Dept. CP, Box 4063, Station A, Charleston, W. Va. Check CP 4765, pages 2 and 3.)

Wide variety of soils removed from equipment, floors, walls by non-soap detergent . . .

compound won't harm normal hands, nor induce rusting of ferrous metals

Uses: For hand washing of metal, glass, or porcelain equipment; cleaning concrete, asphalt, linoleum, hardwood, and other floors; and cleaning painted surfaces.

Features: Detergent removes wide variety of soils by acid neutralization, wetting out, solubilization, displacement, and emulsification. It cannot harm normal hands, will not induce rusting of ferrous metals, is safe on natural, synthetic fibers.

Description: Nu-D-Tergent is a 100%-active organic non-soap detergent, containing no heat-producing free alkali. Compound dissolves rapidly in cold or hot water to form a clear solution, free from curds even in very hard water. Concentrations of about 1 ounce per gallon exhibit a surface tension of about 30 dynes.

(Non-soap detergent is a development of Kelite Products, Inc., Dept. CP, 1250 N. Main St., Los Angeles 12, Calif. . . . or for more information check CP 4766 on handy form, pages 2 and 3.)

COOPER ALLOY

CORPORATION
BRIEFS

• Edited by GEORGE BLACK

ELC CAPACITY EXPANDED

To meet the increased demand for ELC grade, the extra low carbon stainless steel which permits welding without subsequent heat treatment, our Foundry Products Division has expanded its melt capacity by more than six tons per day. The cost cutting advantages of cast-weld construction plus the increasing number of processes requiring field fabrication seem to be the stimulus.



NEW DISTRIBUTORS ADDED

Thought you might like to know that the following companies have recently become authorized distributors of our stainless steel valves and fittings:

- Mills & Lupton Supply Co.
Chattanooga, Tennessee
- All-Stainless, Inc.
Boston, Mass.
- John B. Hack & Co.
Woodbury, New Jersey
- Tay-Holbrook & Co.
San Francisco, Calif.



NEW PLANT UNDER WAY

Construction has been started on our new Aircraft Products Manufacturing plant at Clark, New Jersey. We're particularly proud of the developments behind this new plant, because they will save the government more than a million dollars a year, while making it possible to produce jet engine ring components faster and with appreciably less waste of critical materials such as nickel and chromium.



V2B AVAILABLE IN NEW FORMS

A short while back we licensed both Janney Cylinder Company and Crucible Steel Company of America for the production of V2B centrifugally cast cylinders and wrought forms respectively. We're pleased to announce that tests conducted by both companies show our own data to have been conservative. If your product requires a gall and corrosion resistant stainless alloy—with a hardness of 363 Brinell and better—we suggest you contact Janney, Crucible or ourselves for the facts on V2B.

COOPER ALLOY
CORPORATION • HILLSIDE, N. J.

NO. 1 / COOPER ALLOY VALVE FEATURES

EASY OPENING
EASY CLOSING*with large handwheel*

Only
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1. Large handwheel
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3. 100% x-ray of vital cast components
4. Centerless ground stem
5. Ball and socket rotating type discs
6. Extra deep stuffing box
7. Two-piece gland construction
8. Swinging eye-bolts
9. Bowed yoke construction
10. Yoke cap designed for quick replacement

Stainless steel valves are precision instruments. When properly manufactured and cared for, they should open easily as well as provide tight closure. The Cooper Alloy line is designed with an oversized hand wheel to permit fatigue-free hand operation and to make unnecessary the use of wrenches, bars or other "persuaders" which may do serious damage to the disc and seat and multiply the possibility of galling.

New Catalog! A note on your company letterhead will reserve your new 1955 Cooper Alloy valve and fitting catalog.

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Valve & Fitting Division

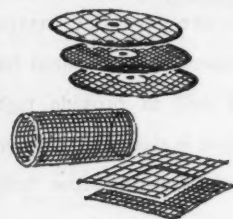
When inquiring check CP 4767 on handy form, pgs. 2-3

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Filter leaves, strainers, sizing screens, etc. We can fabricate most any type of part you need, in any quantity. We'll work from your own prints or, if none are available, our Engineering Department will draw up prints from your description of what the part must do. Once you've O.K.'d them, we'll start production.

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The Cambridge Wire Cloth Co.



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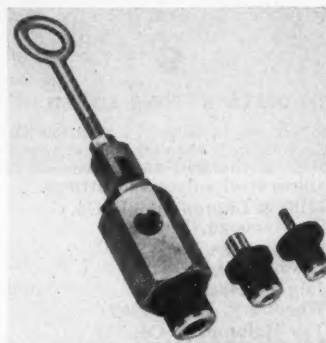
MAINTENANCE

**Connects and seals fast
in vessel testing
applications . . .**

only a couple of seconds and
liquid or gas flow starts

Uses: Connecting and sealing
gas, air, or liquid pressure lines to
standard openings for testing ves-
sels, appliances, systems, or assem-
blies.

Features: Only one or two
seconds are required to seal an
opening and begin flow of gas, air,
or liquid.



Corrosion-resistant materials are
used in construction of valve

Description: Inserting Connecto-
Valve into an opening and depress-
ing cam lever simultaneously ex-
pands connecting seal and opens
valve, effecting a leak-proof seal
and releasing a full flow of gas,
air, or liquid into vessel or assembly
under test. Withdrawal of unit
automatically closes valve.

Corrosion-resistant materials used
in construction of valve body and
component parts are designed for
long service. Neoprene seals are
readily replaced.

Inlet connections are tapped into
valve body for $\frac{3}{8}$ " pipe pressure
lines. Connector valves are avail-
able from stock for sealing $\frac{1}{2}$ ", $\frac{3}{4}$ ",
and 1" pipe openings.

(Valve is manufactured by Me-
chanical Products Corporation,
Dept. CP, 168 N. Ogden Ave.,
Chicago 7, Ill. . . or for more
information reader may simply
check CP 4769 on the convenient
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cated between pages 2 and 3.)

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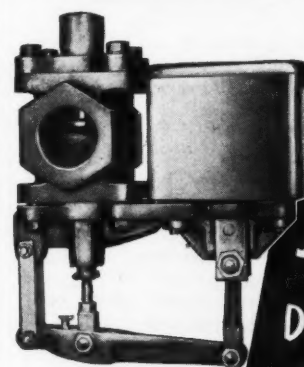
It's Still Our Only Business
— And We Mind It Well!



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DIVISION OF CONTINENTAL COPPER AND STEEL INDUSTRIES, INC.
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When inquiring check CP 4770 on handy form, pgs. 2-3



**OUTSTANDING
FOR STEAM
SERVICE**

**JOHNSON
Direct Operated
SOLENOID
VALVES**

**Stainless steel
valve and seat.
Sizes: $\frac{1}{2}$ " to 3".
Write for facts.**

Job after job, these Johnson
Direct Acting Solenoid
Valves are proving an ideal answer for service on steam
lines. Their design removes the solenoid proper from the
heat of the line, permits a leverage system with ample
power to open against differential pressures up to 150 lbs.
There are no pilot valves or auxiliary pistons, and con-
struction is really heavy duty throughout. You will find
their inherent simplicity and instant response will solve
a lot of operating problems like no other valve can.



THE JOHNSON CORPORATION
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When inquiring check CP 4771 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Two com
add up
with hig**

Uses:
tries whe

Features:
one hous
same rot
pistons f
to discha
in a shor
contour v

This des
pressure
only 130
It has a
sure of 1

Description:
pressor
It can be
Can be fu
can be dr
or air c
be used
applicati
chamber

(Compre
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Petersen
San Fran

**Provide
for fan**

Axial
illustr
sheets

Bul 5
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Ind.

JANUAR

**Two compressors in one housing
add up to small, light unit
with high output**

Uses: In the chemical or food processing industries where clean compressed air is essential.

Features: Design incorporates two compressors in one housing. Both compressors are served by the same rotor and reciprocating blades, which act as pistons for suction and compression. Curves leading to discharge ports provide a rapid rise in pressure in a short space and time. Rotating blades follow this contour without leakage.

This design accounts for small size-weight/output-pressure ratio. One unit (the 120 cfm size) weighs only 130 lb and has dimensions of only 11 x 9 x 9". It has a capacity of 120 cfm and a discharge pressure of 120 psi.



120 cfm compressor shown with end plate off

Description: Rotary-reciprocating single-stage compressor can be built in any size for any purpose. It can be oil lubricated or, by use of special materials, can be furnished to operate without lubrication. Unit can be driven by any conventional means. Either water or air can act as cooling medium or Freon can be used for refrigeration applications. In the last application cooling space will form part of suction chamber and be connected to suction openings.

(Compressor, which will be built by Union Machine Co. of San Francisco, is a development of Petersen Enterprises, Dept. CP, 2647 Buchanan St., San Francisco 15, Calif. Check CP 4772, pgs. 2 & 3.)

**Provides ready information
for fan specification**

Axial flow, direct-connected exhaust fans are fully illustrated with performance charts, specification sheets, and application data in 8-page bulletin.

Bul 500 is issued by M & E Manufacturing Co., Dept. CP, 2571 Winthrop Ave., Indianapolis 5, Ind. Check CP 4773, pages 2 and 3.



New G-B
SNAP*ON
PIPE
INSULATION

SIZES?

Large or small, we have them ALL!

Good news! G-B Snap*On Pipe Insulation is now available in a complete range of sizes and thicknesses for piping from 3/4" to 33" in diameter. It is also available plain or with factory-applied vapor barrier facing. Now you can insulate hot and cold pipe of all sizes with this unique one-piece insulation molded of feather-light glass fibers!

"One-piece". . . "feather-light"—just picture what these characteristics mean in **savings**. They mean that one man can easily carry complete sections to the job . . . quickly snap them over pipe . . . quickly secure them with staples . . . easily paint or finish them as desired.

And due to the outstanding thermal efficiency of G-B Snap*On (K factor of .23 at 100° F. mean) you enjoy an important "second saving." For any given wall thickness, G-B Snap*On prevents more heat or cold loss than any pipe insulation on the market. Or to look at it another way, now you can use pipe insulation of thinner wall dimensions than you ordinarily use—and still achieve, or improve, thermal efficiency.

Seeing is believing—write today for samples and new 8-page brochure with complete descriptive and technical data.



GUSTIN-BACON MANUFACTURING CO.

254 W. 10th STREET KANSAS CITY, MISSOURI

When inquiring check CP 4774 on handy form, pgs. 2-3



CHIKSAN Swivel Joints illustrated in this installation, facilitate the speedy, economical handling of various fluids through 16 lines from loading dock to manifold pit — a distance of 800 feet. Since each line leads to a separate tank through the manifold, cross contamination is eliminated.



CHIKSAN Swivel Joints in the pump manifold above enable operator to pull base stock from outside storage into the plant and direct flow to proper vessel or proportioner.

The Flow of Enterprise Relies on

CHIKSAN
Ball-Bearing Swivel Joints

CHIKSAN Manifolding Saves 3 Ways!

- ✓ ORIGINAL INSTALLATION
- ✓ NO CONTAMINATION LOSSES
- ✓ LOW COST OPERATION

Original cost of CHIKSAN flexible line manifolding installations often run as much as 50% less than fixed line manifolding operations which incorporate costly multiple valve and line systems.

A CHIKSAN manifolding operation is simplified in its entirety — providing complete flexibility, mobility and ease of operation in limited spaces.

CHIKSAN manifolding installations reduce line hook-up time — keep pit floor clear of lines thereby providing greater working areas.

CHIKSAN manifolding operations facilitate the transfer of all types of fluids safely and rapidly under extreme climatic conditions with no possibility of cross contamination.

CHIKSAN manifolding installations are specifically engineered for long life — easy and economical maintenance, and render years of trouble-free operation.

Our Engineering Research and Development Department will welcome inquiries on your manifolding problems.

Write for Catalog 53-C,
Dept. CP-1



CHIKSAN COMPANY • 2824, CALIFORNIA • Chicago 28, Illinois • NEW YORK • NEW JERSEY
Well Equipment Mfg. Corp. (Wholesale) Houston 1, Texas • Chiksan Sales Company (Wholesale) San Francisco • Montreal 2, P.Q.

When inquiring check CP 4775 on handy form, pgs. 2-3

ENGINEERING AND MAINTENANCE

Ventilation of confined areas made possible by mobile blower-exhauster unit . . .

may be used with or without collapsible duct

Uses: Removing toxic or fume-laden air from tunnels, manholes, and other confined areas; removing smoke from factory or foundry operations; dust



removal in operations such as sandblasting, cement unloading, plaster chipping, or dry chemicals handling; or removing fumes resulting from welding or paint spraying.

Features: With its duct, mobile ventilator is of value in ventilating confined areas which cannot be reached satisfactorily by conventional stationary ventilating equipment. Where conditions permit, ventilator may be used without collapsible, easily transported duct.

Description: Ventilator unit is driven by a 3450 rpm, explosion-proof electric motor, capable of moving approximately 3000 cu ft of air per minute. It is supplied complete with 15' of three-wire electrical cable, and a 15' length of 14" diameter duct, and two carrying belts.

(Mobile ventilator is a product of Mine Safety Appliances Company, Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. . . . check CP 4776, pages 2 & 3.)

High ratios of speed reduction in limited space

Design data, selection tables, dimensions, weights, and installation photographs are included in 8-page bulletin on shaft-mounted drives.

Bul 7101 is available from The Falk Corp., Dept. CP, 3001 W. Canal St., Milwaukee 8, Wis. When inquiring specify CP 4777 on handy form, pages 2 and 3.

C
W
A
N
Spe

SUPREME
No. 502
\$950.00
COMPLETE
Less Motor

Discharge
Up to

CRUSHER
Hard,
Brittle

FOR W
Rosin,
Glass,

DESIRA
Positi
and D

RUGGED
Many
35 Ye

Free Test
Your Material

Since 1918
Range of
needs; f

SU
C

Mtd. by FR
36 MEAD

When
on l

JANUA

CRUSH WAX AND RESINS to Speed Processing



SUPREME
No. 502
\$950.00
COMPLETE
Less Motor

Discharge: $\frac{1}{2}$ " to 4"—adjustable
Up to 500 Pounds per Minute

CRUSHES ANY MATERIAL

Hard, Soft, Resinous, Waxlike,
Brittle, Lumped, Caked, Granular.

FOR WAX, SPONGE IRON and

Rosin, DDT, Resins, Asphalt, Salts,
Glass, Chocolate, Asbestos, etc.

DESIRABLE OUTPUT, FEW FINES

Positive Chopping Action. Feed
and Discharge are Automatic.

RUGGED, HEAVY DUTY "SUPREME"

Many in Continuous Service for
35 Years . . . Results Guaranteed.

Free Test Run — Send 50 Pounds
Your Material. Crushed to Desired Size, Returned.

Since 1918—"Supreme" Standard Crushers
Range of Standard Models to meet your
needs; from \$425. Immediate Shipment.

SUPREME CRUSHERS

Mfd. by Franklin P. Miller & Son, Inc.
36 MEADOW ST., E. ORANGE 2, N. J.

When inquiring check CP 4778
on handy form, pgs. 2-3.

ENGINEERING AND MAINTENANCE

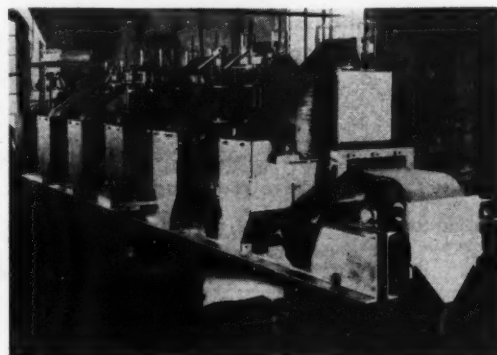
Magnetic materials recovered by cross-belt separator with close control

Uses: Selective separation and concentration of
ores, minerals and other materials.

Features: Electromagnetic cross-belt units permit
close control, greater burden penetration, separation
of weakly magnetic material not recoverable by other
means.

For most materials a capacity of 1000 to 1500
lb/hr/ft of belt width can be obtained. When gaps
of machine have once been set and most efficient
belt speed determined, no further attention is re-
quired. Maintenance is low and operation is entirely
automatic and continuous.

Description: Memco-Hope Type CB cross-belt
separator can be supplied in sizes ranging from the
laboratory unit having a main conveyor belt 3" wide
with one cross belt, to a machine having a main
conveyor 24" wide with eight or more cross belts.



Six cross-belt unit tin-tungsten ores

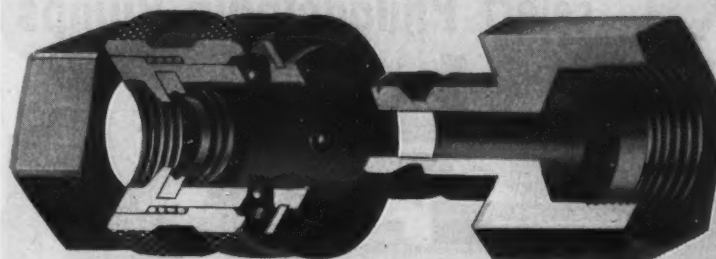
Separators are equipped with adjustable feeders,
either mechanical or magnetic, which deliver ma-
terial in a thin, uniform stream onto conveyor
belt. Speed of main conveyor belt is adjustable
with a ratio of 3 to 1, cross belts have a speed
regulation of 5 to 1. Magnetic gaps through which
material passes are adjustable by means of simple
screw adjustments within easy reach of operator.

(Cross-belt separators are products of Magnetic
Engineering & Mfg. Co., Dept. CP, Clifton, N.J.
. . . or check CP 4779, pages 2 and 3.)

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on pages 170 to 173.
All products and services discussed in this issue, in
either editorial or advertising, are listed there.

...to make a leakproof connection



in one second

New, economical Titeflex QUICK-SEAL Couplings
are leakproof at *all* operating pressures—provide
full swivel action, full free flow, versatility, long
service life—couple & uncouple IN ONE SECOND
without tools. QUICK-SEAL Couplings are inter-
changeable in the same size; come in a variety of
alloys in many sizes— $\frac{1}{4}$ " to 12" diameter.
Straight-through, Single and Double Check-valve
types. *Write today for Titeflex QUICK-SEAL
coupling catalog.*



SEE US IN BOOTH NO. 750 AT THE
PLANT MAINTENANCE SHOW IN CHICAGO

Titeflex

Titeflex, Inc.
Industrial Products Division
509 Hendee Street
Springfield 4, Mass.

QUICK-SEAL COUPLINGS

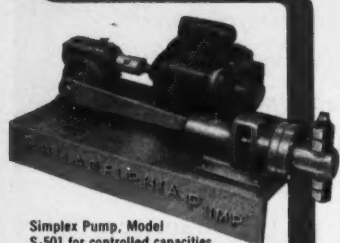
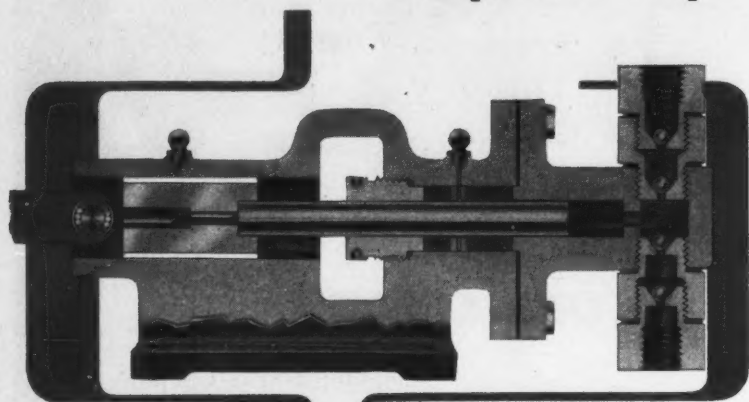
Please send your new, free Quick-Seal Coupling Catalog.

Name _____
Title _____
Firm _____
Address _____
City _____ Zone _____ State _____

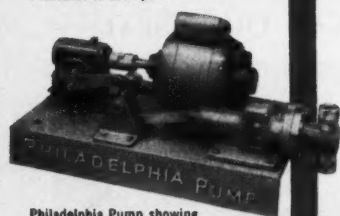
The higher the pressure the tighter the seal

When inquiring check CP 4780 on handy form, pgs. 2-3

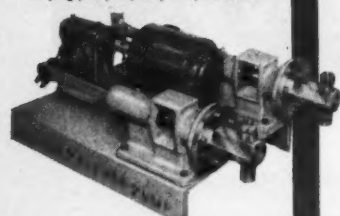
Engineers who know pumps best ... select Philadelphia Pumps



Simplex Pump, Model S-501 for controlled capacities from 5 cc per minute to 5 gph. Pressures to 1500 psi.



Philadelphia Pump showing rocker arm micro-adjustment for varying pump capacity in operation.



Heavy Duty Duplex Pump, Model S-3032 for controlled capacities to 750 gph. and pressures to 10,000 psi.

Philadelphia controlled capacity chemical pumps are designed for pump men—to meet the practical requirements of low initial cost, operating and maintenance economy.

Design features dependable, common sense, low cost arrangements that offer better service with less grief than any other chemical pump on the market.

For instance all Philadelphia Pumps are constructed to allow removal of all moving parts through the oversized crosshead without breaking piping connections—a great advantage in maintenance.

Packing gland is easily accessible at both ends.

Valves of liquid ends are machined of solid stainless steel bar, thus eliminating pressed seats which can work loose in operation.

All Philadelphia Pumps feature strong, rugged construction.

Automatic capacity control mechanisms include conventional rocker arm with Micro-adjustment, Uni-Feeder and patented "Philatrol."

For complete description of Philadelphia Pumps and Pump Selection Chart, write for new Bulletin S-1254. PHILADELPHIA PUMP & Machinery Co., Inc., 1513 Race St., Phila. 2, Pa.

PHILADELPHIA PUMP

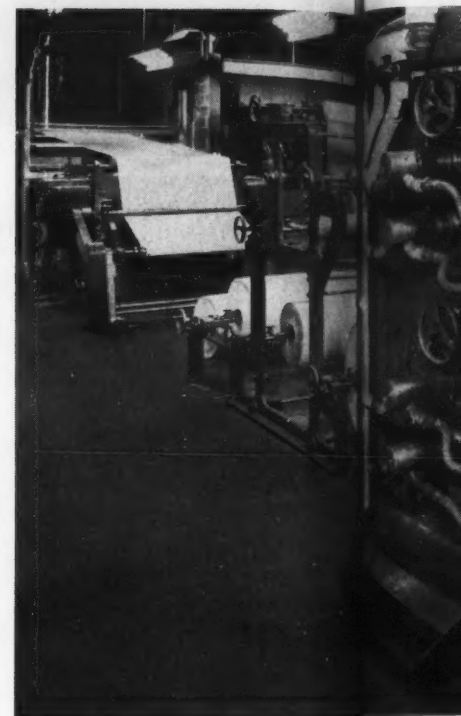
AND MACHINERY COMPANY, INC.

SUBSIDIARY OF AMERICAN METER COMPANY / EST. 1836

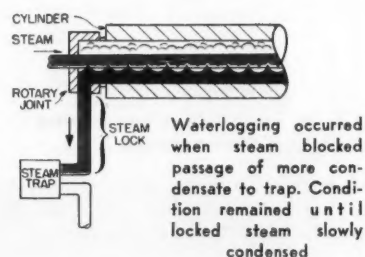
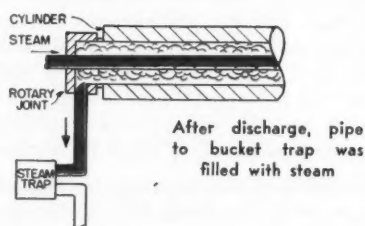
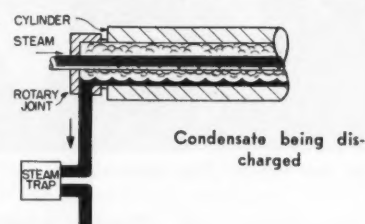
When inquiring check CP 4781 on handy form, pgs. 2-3

engineering and maintenance

This paper embossing machine now uses
steam-lock release traps (arrows) which —



Why Cylinders Were Waterlogging



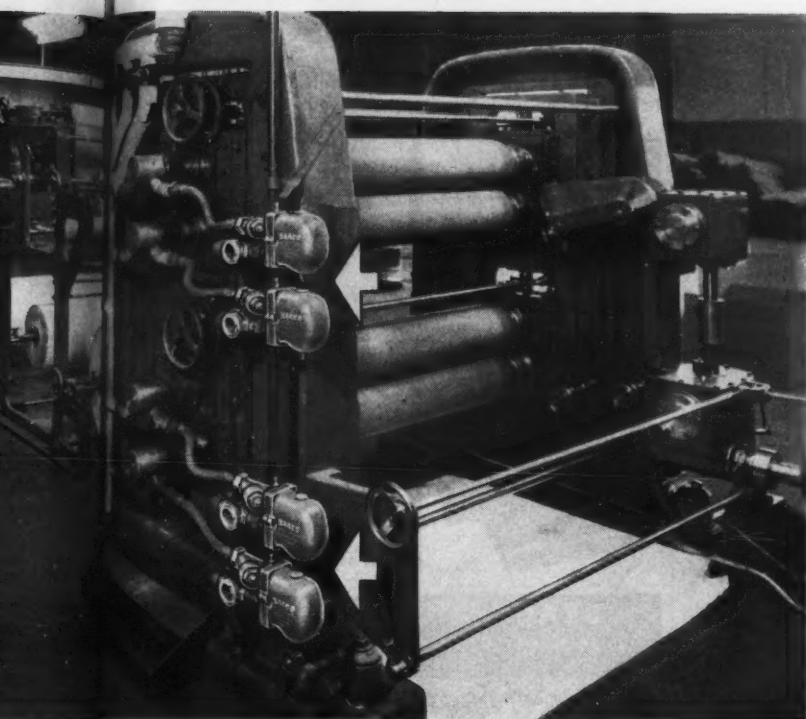
increase machine speed

Higher, more even temperature maintained across faces of steam-heated cylinders

Problem: Steam-heated cylinders of paper embossing machine at Cushion Pack Co., Hawthorne, N.J., were waterlogging. Because of this condition, which gave low and uneven temperatures across faces of embossing rolls, machine had to be operated at 40 fpm, although rated at 250 fpm.

Paper embossed by this machine is glued in layers to make air-filled cushions. These cushions are used as separators and packing material in storage and shipment of fragile items such as candies and pharmaceutical bottles.

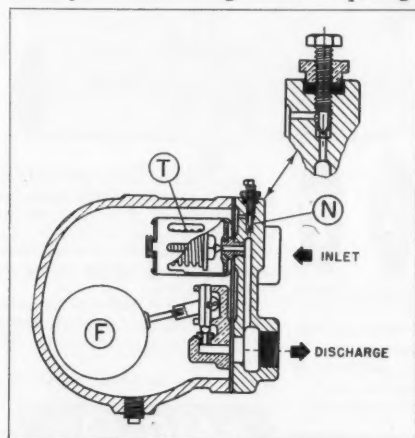
Solution: In November 1953, Cushion Pack replaced conventional bucket steam traps with steam-lock release traps. These units prevent steam locks, and thus, intermittent waterlogging of rolls (cylinders). Built-in adjustable valve releases steam in



Machine speed 525%

pipe connection before it can block condensate flow to trap.

Steam-lock release traps also prevent slow heat-up and air binding. On start-up, large



Steam-lock release trap showing adjustable release valve "N" and thermostatic air vent "T". "F" is float

volume of air in cylinder is quickly discharged by thermostatic air vent ("T" in drawing of unit). Self-adjusting bellows opens vent at slightly below steam temperature, also discharging trouble-making air-steam mixtures that may be as much as 20°F below steam temperature. Air vent functions during machine operation as well as during the start-up.

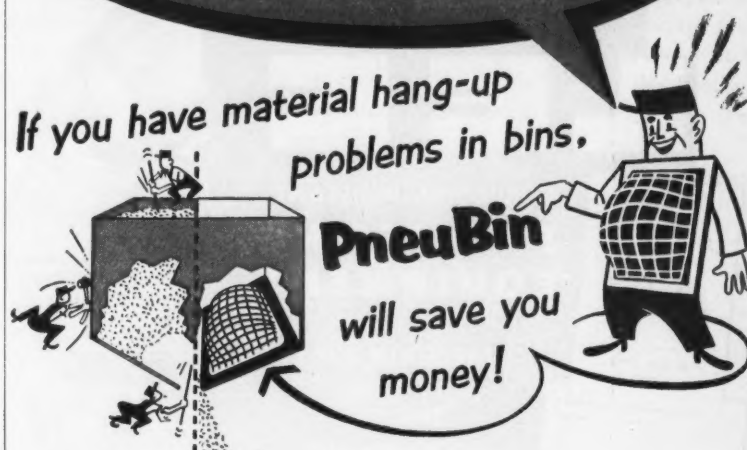
Results: With steam-lock release traps installed, embossing machine can be run at rated speed of 250 fpm — an increase in machine speed of 525%. In addition, pyrometer readings show an increase from 220 to 290°F, and this higher temperature is always uniform across faces of the embossing cylinders.

(Steam-lock release traps are products of Sarco Company, Inc., Dept. CP, Empire State Bldg., New York 1, N. Y. . . . or for more information concerning this product, reader may simply check CP 4782 on handy form, pages 2 and 3.)

PULSATING PANELS

eliminate flow stoppage in bins!

If you have material hang-up problems in bins,



PneuBin will solve your flow stoppage problems and reduce your operating expense. The PneuBin unit consists of steel-backed, neoprene, pulsating panels mounted on the inside wall of your present bins and air controls to regulate the panels' action. By the pneumatic inflation and deflation of the PneuBin panels, the bin contents are positively displaced to insure free flow. After the panels have deflated, the air control unit (operating off the regular plant air supply) starts another cycle of inflation and deflation. The process continues *automatically* at whatever frequency is set on the air controller (this frequency is adjustable).

How PneuBin Saves Money

PneuBin decreases plant operating costs by reducing maintenance, insures constant material flow to production lines and greatly increases personnel efficiency through its quiet operation.

Send for "Flow Stoppage Report" and FREE Literature

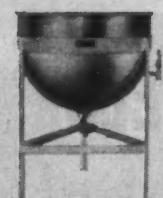
PneuBin engineers will gladly make recommendations with no obligation on your part.

PneuBin

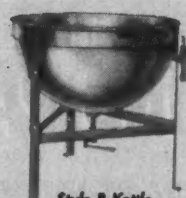
A PRODUCT OF
GEROTOR MAY CORPORATION

1527 Maryland Ave., Baltimore 3, Maryland

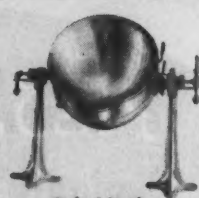
When inquiring check CP 4783 on handy form, pgs. 2-3



Style A Kettle
Two-thirds Jacketed
5 to 500 gal.



Style B Kettle
Full Jacketed
10 to 300 gal.



Style C Kettle
Two-thirds Jacketed
5 to 100 gal.

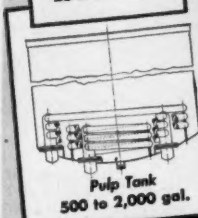
LEE

CORROSION-RESISTANT
**PROCESSING
EQUIPMENT**

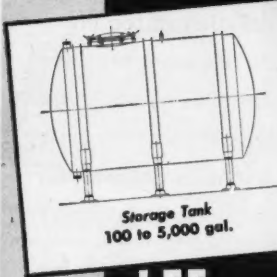
IS
PRECISION BUILT
TO YOUR
SPECIFIC
REQUIREMENTS
TO GIVE
LONG YEARS OF
PEAK PERFORMANCE
WITH
LOW MAINTENANCE



Mixing Tank
25 to 500 gal.



Pulp Tank
500 to 2,000 gal.



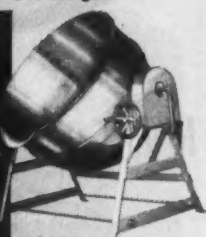
Storage Tank
100 to 5,000 gal.

WRITE
for technical
bulletins fully
describing
each of these
processing
units.

LEE METAL PRODUCTS CO., Inc.

418 Pine Street
Philipsburg, Pa.

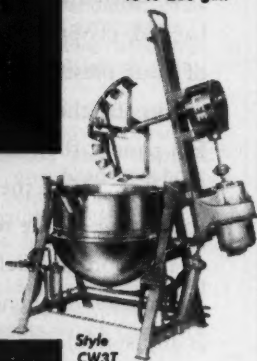
ALL LEE KETTLES
ARE MADE TO
A.S.M.E. CODE



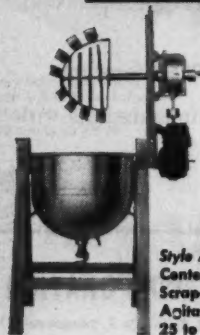
Style CW
Kettle Two-thirds Jacketed
80 to 300 gal.



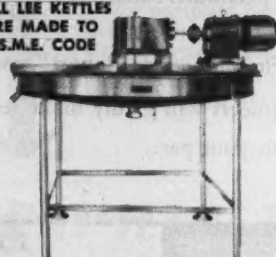
Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.



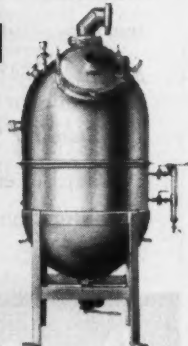
Style
CW3T
Center-Line Scraper
Agitator Kettle
80 to 300 gal.



Style A3T
Center-Line
Scraper
Agitator Kettle
25 to 300 gal.



Quick Cooling Pan
50 to 200 gal.



Vacuum Pan
50 to 500 gal.

When inquiring check CP 4784 on handy form, pgs. 2-3

MAINTENANCE

**High capacity featured
by tiny, three-way
solenoid valve . . .**

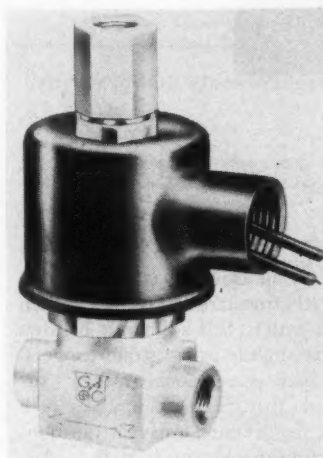
has complete selection of flow
patterns

Uses: Controlling flow of oil, air,
water, or mildly-corrosive chemi-
cals.

Features: Tiny unit has a com-
plete selection of flow patterns. Its
size is an aid in fitting the com-
ponent on a machine.

Solenoid valve is available in brass
for normal applications with oil,
air, and water. It is supplied in
stainless steel for handling mildly-
corrosive fluids.

Description: Three-way sole-
noid valve, designated K-273, can
be furnished as a normally closed
3-way, normally open 3-way, or as
a directional flow control valve.
Unit operates quietly, having a soft



Valve is available in brass or
stainless steel

seal closure to end impact noises
and assure 100% shutoff. Solenoid
is designed to be humless. Solenoid
cover is rotatable for easy installa-
tion.

(Solenoid valve is a product of
General Controls Co., Dept. CP.
801 Allen Ave., Glendale, Calif.
... or for more information
concerning manufacturer's prod-
uct, reader may simply check CP
4785 on the convenient Reader
Service slip which is located be-
tween pages 2 and 3.)

SPEEDIER PUMP-DOWN On Dry or Semi-Wet Work...

High vacuum for processing or for getting ready for ultra-high
vacuum is obtained faster and at lower over-all costs with

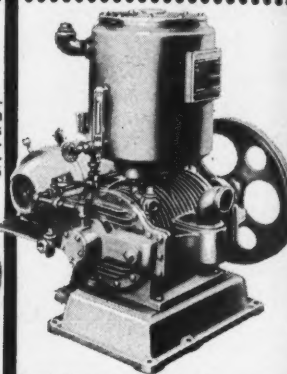
BEACH-RUSS Rotary High Vacuum Pumps

They get the vacuum you want faster than other types and main-
tain it at the lowest operating and maintenance costs available
today. You get far longer service life, too.



Beach-Russ
Type SS Rotary
Vacuum Pumps

are used for vac-
uum up to 5 mm
on tight systems
for dry or semi-
wet work. Capac-
ities of 6 to 375
cfm.



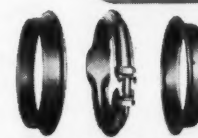
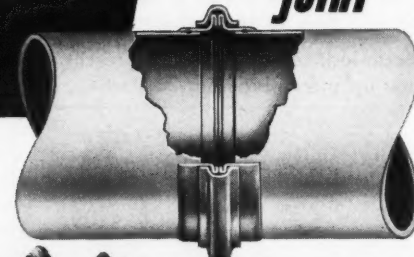
Beach-Russ Type RP Rotary Vacuum Pumps
are used for vacuum of 10 microns or
better on dry or semi-wet work. Capac-
ities of 17 to 845 cfm.

BEACH-RUSS COMPANY

50 CHURCH STREET • NEW YORK 7, N. Y.
Address Department 46

When inquiring check CP 4786 on handy form, pgs. 2-3

New **low cost**
quick assembly
joint



To Apply: Weld Marmar supplied
flanges to tube ends and attach
by means of Marmar coupling.

Reference:

J-41 — stainless steel — Food
J-61 — stainless steel — Ind.
J-62 — cold rolled steel — Auto.

...made of stainless steel or cold rolled steel
for 1" to 5" o.d. tubing. Model J-41, with a vari-
ety of special gaskets, is for use with stainless
steel tubing in the food and chemical indus-
tries. Models J-61 and J-62 are for applications
such as the coupling of exhaust manifolds and
exhaust piping joints.

Economy, ease of application and speedy
disconnect give this joint wide utility in chem-
ical, oil, automotive, marine and many other
industries.

Write, wire or phone Dept. CP-153

MARMAR
PRODUCTS CO., Inc.
11214 EXPOSITION BLVD.
LOS ANGELES 64, CALIF.

**THERE IS A MARMAR
CLAMP OR COUPLING
AT EVERY GOOD JOINT**

When inquiring check CP 4787 on handy form, pgs. 2-3

CHEMICAL PROCESSING

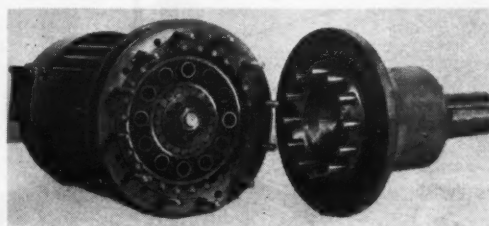
**Only rolling elements used
in reduction gear . . .**

95 to 98% efficiency given even at high reduction ratios effects power savings

Uses: For slow speed or precision drives. Typical applications are mixing vats, conveyors, ball mills, and rotary furnaces.

Features: Gear unit uses rolling elements only. It offers high efficiency — 95 to 98% — even at high reduction ratios, thus effecting savings in power and reducing maintenance requirements. Lubrication is by grease contained in sealed housing of drive.

Description: Cyclo reduction gear is available either as a self-contained unit, for coupling with prime movers and driven machines, or as integral motor gears, combining electric motor with reducer. Reduction ratios range up to 71 per stage; therefore output speeds of a fraction of one rpm may be obtained with a two-stage unit, using conventional electric motors.



Reduction ratios of gear range up to 71 per stage

Line of standard models is available from fractional hp up to 35 hp, with output speeds down to 0.2 rpm — for horizontal or vertical mounting, either with integral electric motor, or as a separate reduction unit.

(Reduction gear is a product of The Ore & Chemical Corporation, Dept. CP, 80 Broad St., New York 4, N. Y. . . . or for more information check CP 4788 on handy form, pages 2 and 3.)

**Discusses small boilers
in 50 to 80-hp range**

Illustrated bulletin describes small boilers which are available in 50 to 80-hp range for heating and processing services. Major advantages of boilers are explained. Photos point up improvements in design. Drawings and specifications of units are included.

Bul AD-135 is available from Cleaver-Brooks Company, Dept. CP, 326 East Keefe Avenue, Milwaukee 12, Wis. When inquiring specify CP 4789 on convenient Reader Service slip which is located between pages 2 and 3.

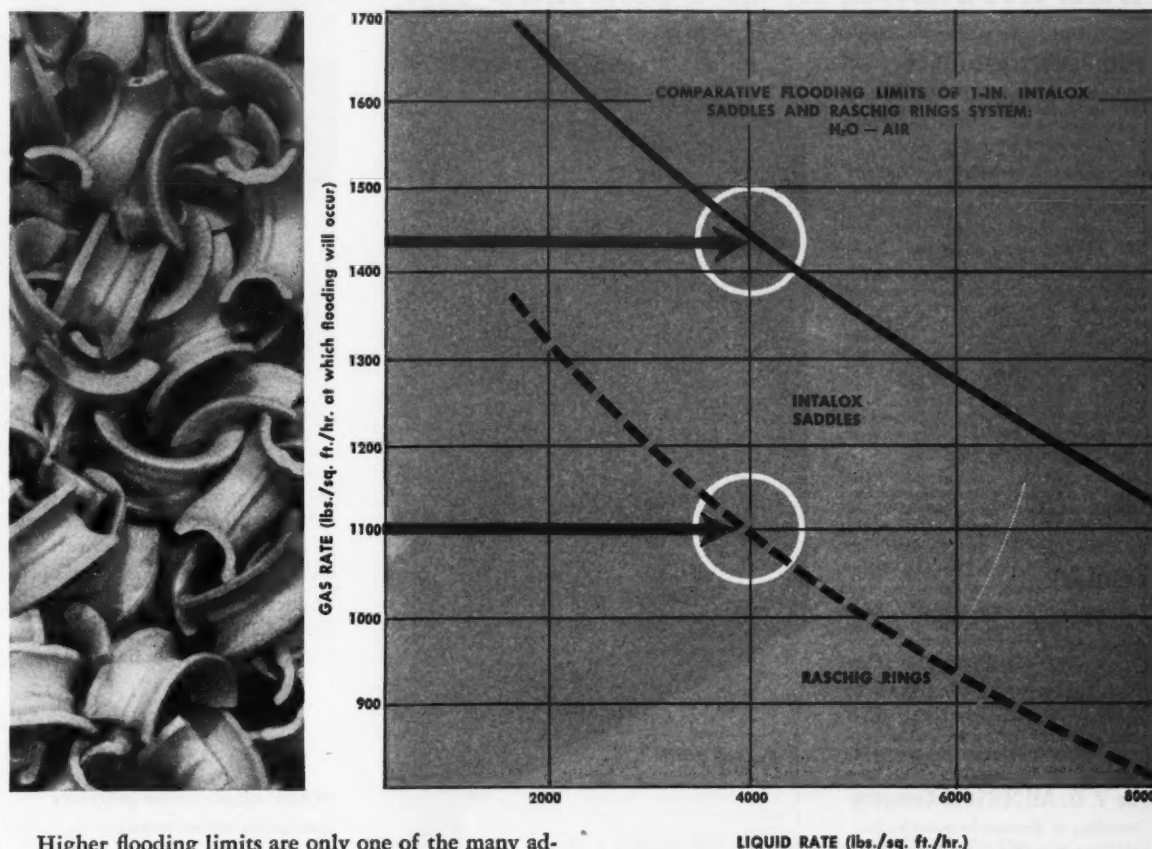
HOW INTALOX SADDLES CAN ADD 30% OR MORE SCRUBBING CAPACITY TO YOUR TOWER

THE higher flooding limits of Intalox saddles offer another convincing factor in any study of relative efficiencies.

For example — if your present tower is packed with Raschig rings, and the tower is now operating to the full limit of its capacity, you can increase its capacity 30% or more by replacing the Raschig rings with Intalox saddles.

Take a look at the chart below showing the com-

parative flooding limits of 1-in. Raschig rings and 1-in. Intalox saddles at various liquid and gas rates. It was prepared from data based on repeated observations by independent authorities. Suppose a tower packed with Raschig rings is operated at a fixed liquid rate of, say 4000 lbs./sq. ft./hr. Flooding will occur at a gas rate of 1100 lbs./sq. ft./hr. But if the Raschig rings are replaced with Intalox saddles, the gas rate can be increased to almost 1450 lbs./sq. ft./hr.



Higher flooding limits are only one of the many advantages you obtain with Intalox saddles. The unique, patented "shape" results in a packed bed of greater randomness. There is more surface area per cubic foot, and even more important, virtually all surface area is effective area. There is more free space, and the free space is more uniform.

It will pay you well to learn more about Intalox Saddle packing and how it can help you reduce tower construction and operating costs. Write for Bulletin IS-29.

THE UNITED STATES STONWARE CO.

Process Equipment Division
NEW YORK CHICAGO

AKRON 9, OHIO
HOUSTON



When inquiring check CP 4790 on handy form, pages 2-3



Case Study No. 111

NEW JERSEY FIRM OVERCOMES TOUGH EVAPORATOR PROBLEM

with INTERNAL Hi-eF PURIFIERS

EQUIPMENT REQUIRED:

Eight Internal Hi-eF Purifiers (Type IMS-16 Monel Construction) were originally installed by this New Jersey firm for a difficult distillate evaporator service. These units proved so efficient in preventing carryover from leaving the evaporators that four additional Hi-eF Purifiers were installed.

SERVICE:

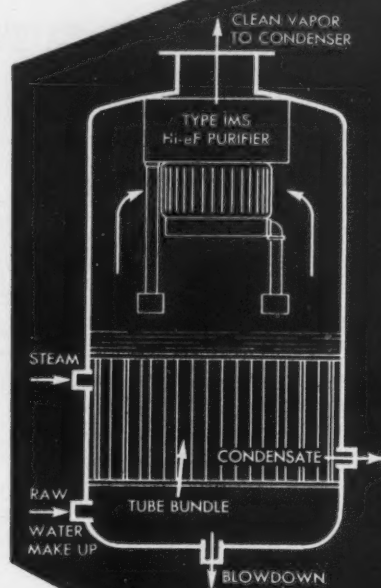
These Hi-eF Purifiers are installed in the vapor chamber of a salt water evaporator where they effectively remove entrained brine from the water vapor before it is delivered to the condenser in the fresh water system. Each Hi-eF Purifier handles 4000 #/hr. vapor at 22" to 27" mercury vacuum, and delivers vapor which contains not more than 0.22 grains (3.8PPM) of chlorine per gallon of distillate with a shell concentration of 1.5/32nds salinity (40,000 PPM).

Distillate purity is automatically controlled by means of an electronic detector. This control device would open a bypass valve and dump the water if the concentration ever exceeded 0.25 grains/gallon.

RESULTS:

The company reports that the Hi-eF Purifiers operate well within the limits of the rigid purity control maintained over the purifiers by means of the electronic detector. The fact that this New Jersey firm has reordered four additional internal Hi-eF Purifiers is proof in itself that Hi-eF Purifiers soon pay for themselves in evaporator service and are extremely efficient in preventing carryover.

The V. D. ANDERSON Company
Subsidiary of Chesapeake Industries, Inc.
1959 West 96th Street, Cleveland 2, Ohio



Free!

Write for Bulletins 101 and 401 describing many money-saving applications with Hi-eF Internal Purifiers.

Hi-eF® PURIFIERS

WATCHDOGS of Steam • Air • Gas • Vapor Pipelines & Equipment

ANDERSON

Support Junior Achievement

Junior Achievement Week — January 30-February 5

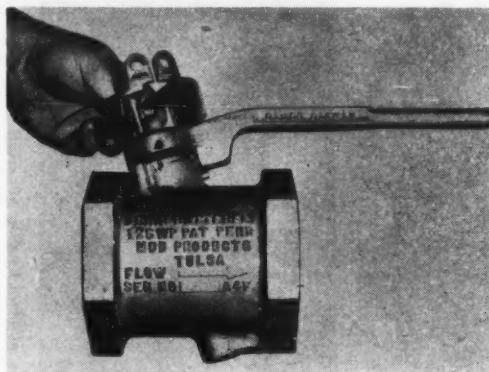
When inquiring check CP 4791 on handy form, pgs. 2-3

ENGINEERING AND MAINTENANCE

**Multiple uses made possible
by materials making up
butterfly valve . . .**

quick-closing, non-lubricated units available in steel, bronze, aluminum, and lined metals

Quick-closing, positive seal, non-lubricated butterfly valves are being offered in semi-steel in small sizes by company. This economical unit for certain applications supplements line of butterfly valves available in a wide choice of materials including: steel, bronze, aluminum, semi-steel, semi-steel with a ceramic lining, and stainless steel. These materials of construction enable valves to be used on many jobs.



Four-inch butterfly valve with optional locking device

Working pressure of units, called Mudco O-ring butterfly valves, is 125 psi. Accessories are available including locking device with which valve may be locked and/or sealed in either open or closed position.

(Butterfly valves are a product of Mud Products Inc., Dept. CP, Philtower Bldg., Tulsa 3, Okla. . . or check CP 4792 on handy form, pages 2 and 3.)

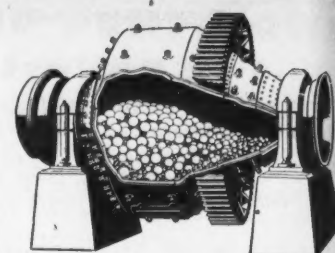
**When application permits
motor in airstream,
fan can be used . . .**

motors are protected, and special finishes can be provided for corrosive conditions

Uses: For all applications where it is permissible for motor to operate directly within airstream.

Features: Motors used with fans are built in standard NEMA frames. They are completely protected against rust, corrosion, and deterioration of insulation. Special finishes for installations in corrosive or abrasive atmospheres can be furnished to protect the fan.

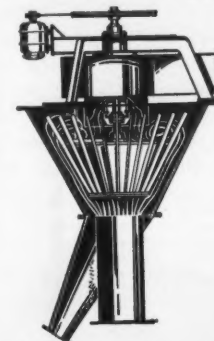
Description: Propellair direct-connected fans are available in sizes from 12 to 60", with air delivery ratings from 1020 to 85,000 cfm free air. Units



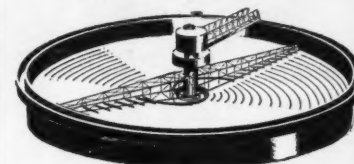
CONICAL & TRICONE MILLS



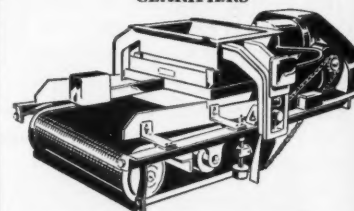
RUGGLES-COLES
ROTARY DRYERS, KILNS, COOLERS



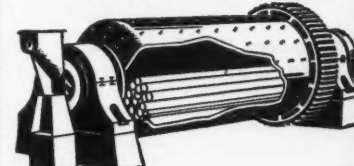
"GYROTOR" AIR CLASSIFIERS



"AUTO-RAISE" THICKENERS
CLARIFIERS



CONSTANT-WEIGHT FEEDERS



CYLINDRICAL ROD & BALL MILLS

Ask for complete line
Bulletin No. 100-A-13

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works
New York • Toronto • Chicago • Kansas • Houston • Salt Lake City • San Francisco

When inquiring check CP 4793
on handy form, pgs. 2-3

CHEMICAL PROCESSING

PUMPS for the PROCESSING INDUSTRY

...that SERVE
WELL and
LAST!

**CORROSION
EROSION
or other
PHYSIO-
CHEMICAL
PROBLEMS**

Fig.
19,488

To Chemical Engineers
who cope with such prob-
lems: Taber builds
pumps of metals or
alloys which the
Engineer has found
effectively resistant to the
specific chemical solution
to be pumped.
Stability of Taber de-
sign never gives way
to design for selling
purposes. You can
get repair parts or
duplicate Taber
pumps for years.

SUGGESTION:
On your business
stationery,
WRITE FOR:

BULLETIN V-837

TABER PUMP CO. Est. 1859
320 ELM ST., BUFFALO 3, N.Y.



When inquiring check CP 4794
on handy form, pgs. 2-3

ENGINEERING AND MAINTENANCE

are equipped with airfoil section propellers. Two-
blade propellers are used on fans designed for opera-
tion at, or near, free air conditions. Multi-blade
propellers are used for applications involving re-
sistance pressure.



Fans are available in sizes from 12 to 60"

Efficiency of airfoil propellers is supplemented by
steel venturi entrance ring with tip seal that leads
air to propeller tips and prevents recirculation. Steel
support arms, welded to the ring, provide a rugged
mounting for motor.

(Direct-connected fans, designated Type CD, are
products of Robbins & Myers, Inc., Dept. CP, Spring-
field, Ohio. Check CP 4795, pages 2 and 3.)

Two-coat work on same day permitted by interior wall sealer

Uses: As a sealer on masonry, wood, and wall-
board surfaces.

Features: Interior wall sealer permits two-coat
work on same day. Can be applied over damp, but
not wet, surfaces where finish coat is to be flat and
porous. Sealer dries to touch in two to four hours
and may be recoated after four hours. Coverage
ranges from 300 to 400 sq ft/gal, depending on
surface over which it is applied.

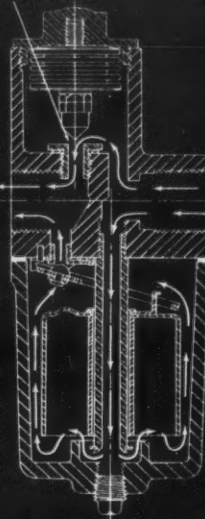
Description: Arcotone PVA is a polyvinyl acetate
material. It has good resistance to heat, fumes,
moisture, and alkali, and does not require sanding.
Application of sealer is by brush or spray.

(Interior wall sealer is a product of The Arco
Company, Dept. CP, 7301 Bessemer Ave., Cleveland
27, Ohio. Check CP 4796, pages 2 and 3.)

STOP CONDENSATE BACK-UP WITH HEAT-KWICK STEAM TRAPS!



AUXILIARY BELLWS
ORIFICE FOR HANDLING
LARGE VOLUMES OF
CONDENSATE AND AIR



● When production on your steam
units fail . . . and you can't get con-
sistent heat in your driers, cookers,
kettles, unit heaters, etc., the chances
are condensate is backing up into
your equipment and cooling it off
. . . actually decreasing its efficiency
as much as 35%!

● Here's the remedy . . . Whenever
you encounter pressure variations
on your steam lines, or heavy con-
densate loads, or the need to vent
air quickly, don't depend upon an
ordinary steam trap to handle the
job even if it has auxiliary air-vent-
ing devices. Call on Heat-Kwick traps,
having two separate orifices, the con-
ventional condensate orifice and a
separate additional bellows orifice.
Whenever a heavy load of conden-
sate is encountered, this bellows ori-
fice snaps into action. As soon as
condensate hits the bellows, it opens
and out goes the condensate in large
volumes.

● For maximum efficiency on steam
units, do the same as hundreds of
other plants, insist on Super-Silver-
top Heat-Kwick traps. Your steam
units will operate at higher efficiency
and at less cost than you ever dreamed
possible!

The V. D. ANDERSON Company
Subsidiary of Chesapeake Industries, Inc.
1932 West 96th Street, Cleveland 2, Ohio

WRITE FOR Bulletin 1153. Tells how to prevent condensate
from backing up with new Super-Silver-top
Heat-Kwick Steam Traps.

SUPER-SILVERTOP HEAT-KWIKS

the Engineered Steam Trap by

ANDERSON

Support Junior Achievement

When inquiring check CP 4797 on handy form, pgs. 2-3

Now you can have
the advantages of **USCOLITE***
in your valves as well
as in your piping



HILLS-McCANNA
Style 584
DIAPHRAGM
VALVE
with
USCOLITE*
BODY

**Uscolite is a registered trade
mark of United States Rubber
Company.*

DESIGN DETAILS

- Working parts isolated from flow.
- No packing.
- Leaktight under pressure or vacuum.
- Simple pinch clamp closure principle.
- Minimum maintenance even in the severest service.

Developed to supplement Uscolite* pipe and fittings, the new Uscolite bodied Hills-McCanna Diaphragm valve, now makes it possible to utilize Uscolite's advantages throughout your piping layout. The unique Saunders patent design of the valve coupled with the chemical resistance of Uscolite makes the valve ideal for plating, water treatment, and in the manufacture of fertilizer, bleach, storage batteries, pulp and paper, etc.

The Hills-McCanna Uscolite bodied valve is available in standard sizes from 1/2" through 2". It is suitable for pressures to 150 psi and for temperatures to 170° F. (at some sacrifice of pressure rating in larger sizes).

Write for details. **HILLS-McCANNA CO.**
2370 W. Nelson St., Chicago 18, Ill.

HILLS-McCANNA

saunders patent diaphragm valves

Also manufacturers of
Chemical Proportioning Pumps • Force-Feed Lubricators
Magnesium Alloy Sand Castings

When inquiring check CP 4798 on handy form, pgs. 2-3

MAINTENANCE

**Loads up to two tons
held by each shelf
of storage rack**

Uses: For storage of large, heavy materials, and to increase capacity and orderliness of bulk storage areas.

Features: Each shelf of rack carries loads up to two tons, and racks of two or three shelves accommodate large-item storage to ceiling height.

Description: F-G-M warehouse racks, constructed of steel angle reinforced at corners with 11-gage steel gussets, are available with skeleton, wood, batten, or steel plate shelves to fit all requirements. Each 36 sq ft shelf holds two 48" storage pallets. Posts are punched in center section for shelf adjustment on six-inch centers.

Design of racks permits a full nine-foot span between post centers, allowing for easy insertion and removal of cumbersome large materials. Ample space is provided for floor storage under racks.

(Heavy-duty storage racks are products of The Frick-Gallagher Mfg. Co., Dept. CP., Michigan Ave. at First Ct., Wellston, Ohio . . . or for more information check CP 4799 on handy form, pages 2 and 3.)

Recommends applications for insulating coating

Characteristics, recommended uses, and application procedure for company's Type 3X insulating coating are included in two-page bulletin. Heat resistant and waterproofing properties are reported for the material which finds use on tanks, vats, pipes, and air conditioning units.

Bulletin on Mastic Type 3X insulating coating is available from Field Service Div., Palladium Mastic Corporation of America, Dept. CP, 328 Union Ave., Rutherford, N. J. When inquiring specify CP 4800 on convenient Reader Service slip located between pages 2 and 3.



A NEW ANGLE IN TEMPERATURE REGULATORS

Same quality and superior workmanship of standard Keckley Temperature Regulators, but a new angle type to reduce installation and fittings cost—for mounting directly on heat exchangers, instant water heaters, etc., with top inlet connections.

The Type T, Angle Temperature Regulator has an overrun feature to protect thermal unit in case temperature at bulb exceeds range of regulator. All wearing parts of stainless steel are renewable. Body is of bronze or semi-steel. Available in 1/2" to 2" sizes with screwed connections, 2" to 8" with flanged connections. Sizes 1/2" to 4" are spring loaded, sizes 5" to 8" are weight loaded.

— Send for Data and Catalog 54-B —

O. C. KECKLEY COMPANY
400 W. Madison St. • Chicago 6, Ill.



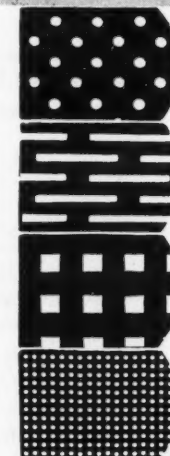
Pressure Regulators • Temperature Regulators • Float Valves • Strainers
Solenoid Valves • Reducing Valves • Pop Safety Valves • Relief Valves

When inquiring check CP 4801 on handy form, pgs. 2-3

Perforated
**STAINLESS
STEEL**

A Specialty —
Not a Problem
with **H & K**

**STRONG • EASILY CLEANED
DEPENDABLY ACCURATE**



PERFORATING STAINLESS STEEL, regardless of alloy content, has long been a specialty at H & K; in fact, meeting stringent specifications for heat, corrosion, acid and alkali resistance through the years has actually made this operation a science! Stainless Steel is one of the most difficult perforating assignments — yet, H & K will satisfy your requirements with skilled accuracy and master craftsmanship.

H & K Perforated Metals are produced to your specifications in practically any sheet, coil or plate material. Whether it's Stainless or any other metal—or a non-metal such as plastics, rubber, plywood, etc. — you can be sure the job is right. Send at once for full information on your problem — recommendations and prices.

Also Remember—H & K
Grilles . . . Ultimate in
Beauty . . . Utility . . .
LONG LIFE!

**The Harrington & King
PERFORATING CO.**

5636 FILLMORE ST., CHICAGO 44, ILL.
114 LIBERTY ST., NEW YORK 6, N. Y.

When inquiring check CP 4802 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Continuous
by self-cl
of rotary

Uses:

Features:
contiguous
negligible.

Description:
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When inquiring check CP 4802 on handy form, pgs. 2-3

CHEMICAL PROCESSING

JANUARY

**Continuous operation permitted
by self-cleaning features
of rotary strainer**

Uses: Pipeline strainer for water or oil service.

Features: Unit is self-cleaning and capable of continuous operation. Pressure drop across screen is negligible.

Description: Rotary strainer has a cylindrical screen within body. A multi-bladed rotor on inside rotates by force of fluid flow. Neoprene wiper blades on outer edge of rotor paddles continually wipe cylindrical screen clean, and debris drops into a catch basin. Increased pressure on upstream side indicates when catch basin is full of dirt and a quick opening valve on drain line is opened to clean basin.

Standard pipe threads on inlet and outlet are supplied with 2, 3, and 4" sizes. Standard ASA 150 lb class flanges on inlet and outlet are supplied with 6" size. Unless otherwise specified screens are made of perforated steel for oil service and perforated bronze for water service. However, galvanized iron, Monel, stainless steel, or other material of perforated sheet or wire cloth are available.

(Self-cleaning rotary strainer is a product of Bos-Co Equipment Engineering & Manufacturing, Dept. CP, 526 S. Boulder, Tulsa, Okla. . . or for more information check CP 4803, pages 2 and 3.)

**Continuous duty at 1800 rpm
given by diesel-powered
electric sets**

Continuous duty (24-hr operation) is available at 1800 rpm for company's externally-regulated D337 electric sets at an output of 110 kw and for externally-regulated D326 electric sets at an output of 85 kw. Similar operation for self-regulated electric sets is available at an output of 103 kw for D337 electric sets and 80 kw for D326 electric sets.

Under the ratings, an output of 162 bhp from D337 engines and 118 bhp from D326 engines is attainable for continuous operation at 1800 rpm.

Continuous 12-hr service is available at 1800 rpm for D337 engines at an output of 182 bhp and an output of 134 bhp for D326 engines.

For 12-hr duty under these ratings externally-regulated D337 electric sets have an output of 124 kw at 1800 rpm and externally-regulated D326 electric sets an output of 95 kw available at 1800 rpm.

Under similar operation for self-regulated electric sets D337 units have an output of 117 kw and D326 units an output of 90 kw.

(Engines and electric sets are products of Caterpillar Tractor Co., Dept. CP, 1937 Walker St., Peoria, Ill. . . or check CP 4804, pages 2 and 3.)

WHEN PRESSURE IS PARAMOUNT Tube Selection Cannot Be Reduced to a Formula—Even a Complicated One

$$\text{Optimum tube for the job} = \left[\frac{(\text{pressure}) \times (\text{diameter}) \times (\text{allowable stress}) \times \mu}{(\text{flow rate})^2 \times (\text{cost})} \right] \phi (\% \text{ Ni} + \% \text{ Cr, temp, atmos}) +$$

B&W
SEAMLESS and WELDED
TUBES

THE BARCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

Barcock Tube, Inc.—Seamless Tubing, Welded Stainless Steel Tubing
Aluminum, Copper-Brass, Carbon Steel Tubing

The choice of the optimum tubing to use in an application requiring the handling of a specific fluid at a definite working pressure involves the consideration of a number of factors. In addition to temperature, tube size, and mechanical strength of the steel, such factors as the type of fluid and corrosion resistance of the steel must be considered.

A typical case of the importance of these two factors involved an installation of Type 347 stainless steel. The tubing was exposed to chloride-bearing bayou water while conveying methanol and unreacted synthesis gases at 300F and 5000 psi. The chloride solution caused pitting corrosion. The stresses became localized at the root of the pits and reached a sufficient magnitude to cause stress corrosion and failure. Croloy 5, subsequently used, provided superior resistance to the initial pitting and satisfactory service at the desired temperature and working pressure and also at a considerable savings in cost of the tubing.

It takes an expert to specify the optimum tubing for any particular application. And there is no substitute for the kind of experience with such problems you'll find at B&W. To get the most benefit from B&W's long experience in matching tubes to jobs call on Mr. Tubes, your nearby B&W Tube Representative. He can help you.

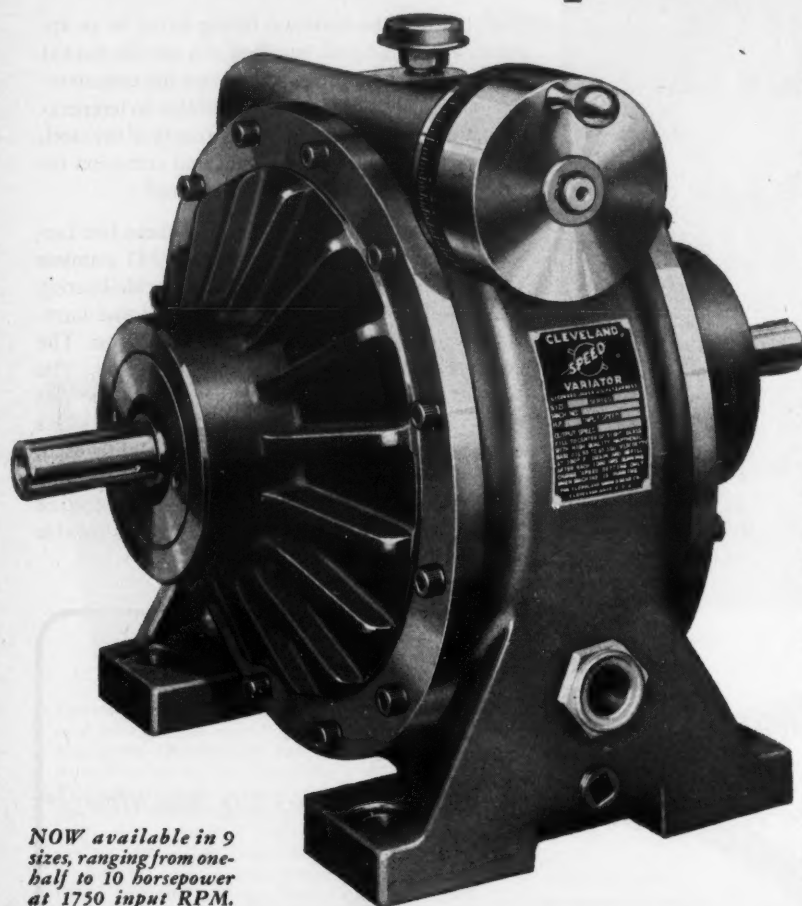
TA-4024 (P)

When inquiring check CP 4805 on handy form, pgs. 2-3

Can you use a compact drive with infinitely variable speeds?

HERE IT IS

Cleveland Speed Variator



NOW available in 9 sizes, ranging from one-half to 10 horsepower at 1750 input RPM.

INFINITELY variable, stepless speeds within a 9:1 range (from $\frac{1}{2}$ to 3 times the input speed).

Smooth, instant change of speed by simple manual adjustment or by remote control devices, either manual or power operated.

Operating efficiencies—75% to 90%.

Coaxial input and output shafts, rotating in same direction, either clock-wise or counter clock-wise.

Ample bearing support for both input and output shafts to carry overhung pulleys.

Compact and inherently quiet and smooth running, due to simple construction.

Minimum maintenance and long life, due to absence of belts and other complicated linkage.

Performance proved by prolonged tests in the laboratory and field operation.

These are the outstanding advantages of the Cleveland Speed Variator. It is now ready for service. Immediately applicable to a wide variety of machines and equipment where a dependable variable speed drive is required. For detailed description and specifications, write for Bulletin K-100.

HOW THE CLEVELAND SPEED VARIATOR WORKS



Power is transmitted from input shaft to output shaft through alloy steel driving bells which are in pressure contact with discs attached to the two shafts.

Relative speeds of the shafts are adjusted by changing the positioning of axles on which the bells rotate (see diagrams, left, and cutaway view, right).



THE CLEVELAND WORM AND GEAR COMPANY

Speed Variator Division, 3257 East 80th St., Cleveland 4, Ohio
Sales Representatives in all major industrial markets

When inquiring check CP 4806 on handy form, pgs. 2-3

ENGINEERING AND MAINTENANCE

For the process industries — electric equipment

Bulletin of 28 pages provides detailed information on company's electrical equipment for power generation, power distribution and conversion, power utilization, instrumentation, descriptive publications, and company's service shops and warehouses, applicable to the process industries.

Bul GED-1966A is issued by General Electric Company, Dept. CP, One River Road, Schenectady 5, N. Y. When inquiring specify CP 4807 on handy form, pages 2 and 3.

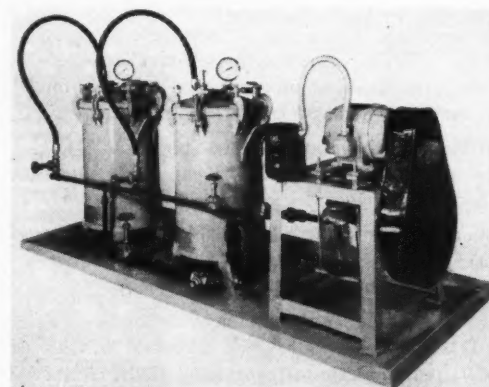
Pump on impregnating unit will pull and hold 99.5% vacuum . . .

constant flushing of pumping unit with oil permits evacuation of "difficult" vapors

Uses: Impregnation of coils, condensers, capacitors, transformers, laminated plastics, castings, and wood.

Features: Model S.W.M.F. pump used on impregnating unit will pull and hold 99.5% of perfect vacuum. It is vibrationless and quiet in operation. Constant flushing of pump with lubricating oil keeps it free of contaminants. This permits pump to evacuate "difficult" vapors which may be corrosive or condense within pump to form sticky solids.

Description: Package impregnating unit is complete with tanks, pump, necessary gages, piping, controls, and wiring. Tanks and pump are set in tray mounting ready for use.



Impregnating unit is complete package

In operation, parts to be impregnated are loaded into one tank and vacuum started. When this part of cycle is completed, a valve is opened and impregnant is drawn into tank. When impregnating time has elapsed, vacuum is broken by opening another valve.

While one tank is working, the other is being loaded and unloaded. Tanks are of galvanized steel. Impregnant used varies with base product.

(Package impregnating unit is a product of Lammert and Mann Co., Dept. CP, 1753 Walnut St., Chicago 12, Ill. . . or for more information check CP 4808 on handy form which is located between pages two and three.)

**Formulated for aerosol dispensing
lubricant carrier assures even
flow of MoS₂ to metal . . .**

material is non-flammable and may be sprayed on hot surfaces

Uses: Lubrication of metal surfaces including hot forming operations, wear-in gears, toggle joints, power screws, and reciprocating parts.

Features: Dispersion of micro-fine solid lubricants, principally molybdenum disulfide, is aerosol packaged. Carrier is blended specifically for applying a controlled, uniform flow of molybdenum disulfide to metal surfaces by spraying from the pressurized container.

Lubricant is non-flammable and may be sprayed on hot surfaces. It is non-corrosive, non-toxic, and does not contain a resin binder.

Description: Lubricant dries quickly leaving a solid, lasting lubricating film, which effectively prevents galling and seizing.

Heating part to be sprayed has been found to help provide a uniform coating. To insure most effective lubricating action, it is advisable to clean part with any standard cleaning solvent which will leave a dry surface.

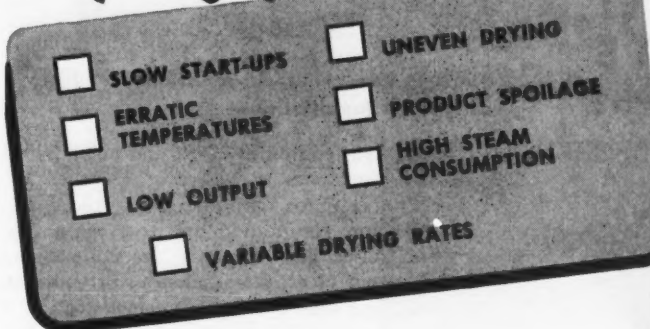
(Aerosol-dispensed lubricant, Moly-Spray-Kote, is a product of The Alpha Corp., Dept. CP, 179 Hamilton Avenue, Greenwich, Conn. . . or for more information check CP 4809 on handy form, pages 2 and 3.)

**Extensive pump line
pictured in catalog**

Information on construction features, performance and selection tables for complete industrial line of company's pumps is included in 108-page illustrated catalog. Several pages are devoted to useful information related to liquid material handling problems.

Cat I-54 is available from The Deming Company, Dept. CP, 522 Broadway, Salem, Ohio. When inquiring specify CP 4810 on handy form, pages 2 and 3.

Which is your drying problem?



Often the solution is simple and inexpensive...

While it's human to blame these dryer problems on the dryers themselves, the truth is that they're often due to...

...use of the wrong type of steam trap, causing equipment to waterlog... or heat-robbing air in steam spaces... or wasteful, unreliable, manual temperature control.

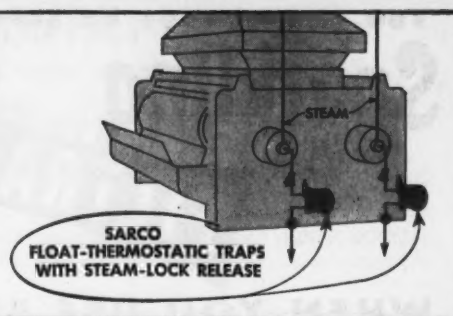
Any one of these could cause poor dryer performance... loss of production, product spoilage, waste of manpower and steam.

See (right) how simply and inexpensively these troubles have been cured by Sarco products and know-how. Tell us about your problems and we'll be happy to put our 43 years of experience to work for you. Just call your nearest Sarco representative, or write Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

SARCO

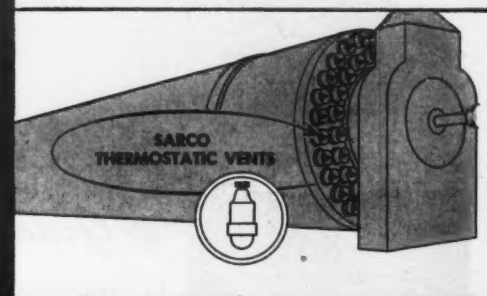
improves product quality and output

Sarco has a wealth of helpful information on trapping, air venting and temperature control. Tell us about your problem — we'll be glad to send you this information and case history solutions to problems similar to yours.



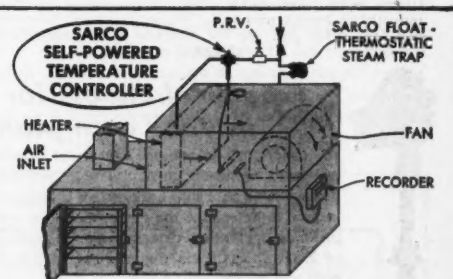
SPOTTY DRYING ELIMINATED: This atmospheric double drum dryer periodically waterlogged because of steam-lock in syphon pipe. Cold spots on drum surfaces, uneven drying and production slow-downs resulted.

By simply replacing the original traps with Sarco Float-Thermostatic Traps equipped with built-in steam-lock release valves... these drying troubles were completely eliminated.



CURE FOR SLOW WARM-UP: When air gets into steam spaces of a dryer it forms a heat-insulating film between the steam and heat-transfer surfaces... efficient transfer of heat from steam is impossible. Result: slow warm-up; prolonged drying time.

Simple, inexpensive cure for this condition are Sarco Air Vents, such as installed on above rotary steam tube dryer.



TEMPERATURE PROBLEMS SOLVED: Manipulating steam valves to control temperature wastes manpower and steam... is often the cause of product spoilage.

Sarco Self-Powered Temperature Controllers, as on this tray dryer, solve this problem... hold dryer at maximum temperature without danger of overheating. Inexpensive, simple and dependable.

When inquiring check CP 4811 on handy form, pgs. 2-3

You can always be sure of a
Sparkling
FILTRATE

**WHEN YOU USE ERTEL
ASBESTOS SHEETS
... the accepted standard!**



• Ertel Asbestos Filter Sheets are available for all types of filters using filter disks. Their high quality is recognized by industry as having no equal. We invite you to take advantage of our free offer and see for yourself why Ertel Sheets are the accepted standard.



**Free Ertel Sheets for Test
in your own plant**

In order to determine the exact grade of sheets necessary to meet a particular requirement, tests should be made. The Ertel Laboratory maintains a free test service to determine the grade sheet best suited for your product, and upon determination a sufficient quantity of Ertel Sheets for a single set-up in your filter will be sent you without obligation.



FAMOUS ERTEL HAND CAPPER

Interchangeable chucks permit capping up to 40 mm caps. Ideal for sample lots or where mechanical devices are not applicable.

**ERTEL ENGINEERING
CORPORATION**

KINGSTON 3, NEW YORK
Branch Office & Showroom Located in New York City

COMPLETE LINE OF
LIQUID HANDLING EQUIPMENT



When inquiring check CP 4812 on handy form, pgs. 2-3

new literature

**Includes flow charts, descriptions
of cyclone installations**

Design, construction, features, and operation of cyclone separators is subject of 18-page catalog. Units can be used for slurry thickening, classification, clarification, and recovery of suspended solids. Flow diagrams, descriptions, and photographs of actual installations in chemical, mining, and coal industries are included.

Cyclone catalog is issued by Heyl and Patterson, Incorporated, Dept. CP, 55 Fort Pitt Blvd., Pittsburgh 22, Pa. When inquiring specify CP 4813 on handy form, pages 2 and 3.

**Dodecenylsuccinic
anhydride**

Of interest to producers of plastics, natural and synthetic rubbers, and paints, enamels and varnishes, dodecenylsuccinic anhydride is subject of six-page folder. In addition to valuable information on physical and chemical properties of the compound and its uses, folder contains the infrared absorption spectrogram and a chart relating the effect of temperature on viscosity. Bibliography of eleven references is included.

Bul I-8 is issued by National Aniline Div. of Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. When inquiring specify CP 4814 on handy form, pages 2 and 3.

**Bulletin explains, illustrates
tristimulus colorimeter**

Illustrated six-page bulletin explains operation and uses of tristimulus colorimeter and exposure heads. Instrument measures color on three scales to determine color difference between two objects, or color of an object relative to a standard. Measuring circuit has been designed to incorporate motor-driven potentiometers for speed, ease of operation.

Bul number 156 is issued by Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. Specify CP 4815 on handy form, pages 2 & 3.

**Industrial bulletins pertinent to
the reader . . . offering data on
products, processes, services**

**How cooling towers save
on water costs**

Five models of company's cooling towers are illustrated and described in four-page catalog. Units have capacities ranging from 3 through 15 tons. Advantages of construction are detailed and complete dimensions are given to show compact size. Simple selection procedure is given to enable user to pick model of tower best suited to his purposes.

Explanation is given as to how cooling towers save money and water cost by allowing reuse of same water, which would ordinarily be discharged from refrigeration and air conditioning systems.

Bul 402-A is available from Dept. 402, Acme Industries, Inc., Dept. CP, 411 Mechanic St., Jackson, Mich. Specify CP 4816, pages 2 and 3.

**Package filling problems solved
by net-weighing units**

Company's line of Elec-Tri-Pak net-weighing and filling machines is described in six-page bulletin. Advantages of using these units to do packaging jobs now done by hand are discussed. Six models of the machine are presented. Bulletin also points out that there is a semi-automatic or automatic model for packaging nearly any dry product into almost any style container.

"Profitable Solution to Your Package Filling Problems" is issued by Triangle Package Machinery Co., Dept. CP, 6633-35 West Diversey Ave., Chicago 35, Illinois. When inquiring specify CP 4817 on handy form, pages 2 and 3.

**Remote viewing handled
by periscopes**

Bulletin of four pages covers construction of typical periscopes, steps necessary in planning for an industrial periscope, and data needed when ordering such units.

Bul 301 is issued by Kollmorgen Optical Corporation, Dept. CP, 347 King St., Northampton, Mass. Specify CP 4818 on pages 2 and 3.

**Roofs will last longer than ever
— due to recent developments**

Difficult roofing and waterproofing problems are now solved where there have previously been repeated failures. Contributing to successful solutions is a fiberglass membrane. Virtually indestructible open-mesh construction provides highly dependable reinforcement of coatings used on all types of roofs.

To show how far we have progressed since man first sought to put a roof over his head, developers of this product have published a booklet that informatively contrasts the old and new in roofs.

Written in humorous style, it is enlivened with cartoons and quips that afford a quick look at what has happened between the dim past and today.

Thatched roofs, Arabian tents, Egyptian clay tile, Greek marble and slate roofs of the middle ages are all subjects of comment. The more recent tarpaper and roofing felts also receive attention. All this leads up to a summation of the features of the fiberglass roofing membrane: resistance to rotting, tearing, plus open weave, lightweight and low cost.

"Roofing Then and Now" is issued by Twinsburg-Miller Corp., Dept. CP, Box 207, Twinsburg, Ohio. When inquiring specify CP 4819 on handy form, pages 2 and 3.

**Stainless steel in process industry
— how to make the most of it**

Stressing importance of using stainless steels only where they prove to be of best advantage to industry, 44-page booklet describes metal's particularly valuable characteristics and advises how to spot its good applications. With a chart of laboratory corrosion data and supplementary text, literature tells kinds of corrosion and corrosive media that stainless steels will withstand successfully.

"Making the Most of Stainless Steels in the Chemical Process Industry" is available from Crucible Steel Company of America, Dept. CP, P. O. Box 88, Pittsburgh 30, Pa. When inquiring specify CP 4820 on the convenient Reader Service slip which is located between pages 2 and 3.

BRIDGEPORT BRASS COMPANY

CONDENSER AND HEAT EXCHANGER TUBE EDITION

COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

How Surface Films Affect Condenser Tube Corrosion Rate

The nature and distribution of surface films formed on condenser and heat exchanger tube surfaces has a tremendous influence on the rate of corrosion. These films may be formed in two ways: (a) by deposit of waterborne materials which may either protect the metal or accelerate corrosion; (b) as the result of a chemical reaction which forms a corrosion film. These films may or may not protect the metal.

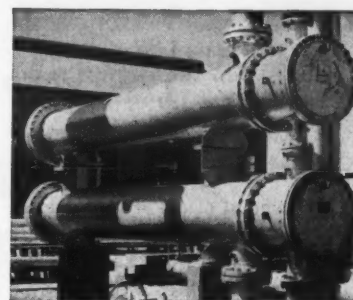
The films which form on metals may vary in thickness, color, chemical composition, smoothness, physical properties and permeability to water.

Protective Films

Some of these films measure about 1/10,000,000 of an inch in thickness but may give considerable protection against corrosion.

During their early stages of formation, these films may be sensitive to injury from abrasion, impingement or changing water conditions. This initial sensitivity explains the rapid attack sometimes evident in newly installed tubes. Tubes that are given a chance to develop a uniform, adherent film are frequently able to resist progressively more severe corrosive conditions without serious effect.

The various condenser tube alloys available show great differences in their ability to rebuild their protective film and in the speed with which they do so. Rapid healing of broken films is an outstanding characteristic of Bridgeport Arsenical Aluminum Brass, Duronze IV (arsenical aluminum bronze) and 70-30 Cupro Nickel. This is a direct result of the low rate of solubility of the alloy and/or its film. This film strength explains why these alloys withstand impingement corrosion so successfully. However, if the water contains corrosive agents which destroy the film, the corrosion resisting properties of the metal are greatly reduced. The difference in ability to rebuild a protective film should be considered by



operators getting unsatisfactory service life from tube alloys. This is influenced by the type of tube, water velocity, composition of the water, etc.

Nonprotective Films

Those surface films which are nonprotective usually are insoluble in the corroding medium, and have the following characteristics: 1) They are permeable to water (they permit the passage of fluid through them). 2) They are sufficiently dense to impede the flow of fresh corrosive solution to the metal surface and the movement of corrosion products away from the metal surface. 3) They are nonuniform or discontinuous, thus permitting the corrosive solution to come in contact with metal in certain areas while partially screening the metal in others.

This may lead to the following phenomena: 1) Corrosion may be increased in certain screened areas by the formation of corrosion cells. 2) The metal films of partially permeable film may become pitted (anodic area) or locally corroded. 3) The exposed metal or those areas covered with thinner films are only slightly corroded (cathodic area). 4) The continued accumulation of corrosion products in

the screened areas often accelerates the formation of deeper pits or enlarged areas of corrosion.

The properties of these nonprotective films or deposits aid in the formation of the corrosion cell (metal ion and oxygen) types of corrosion. The corrosion cell begins to operate when the corroding substance is present in different concentrations at adjacent parts on the metal surface (see diagram).

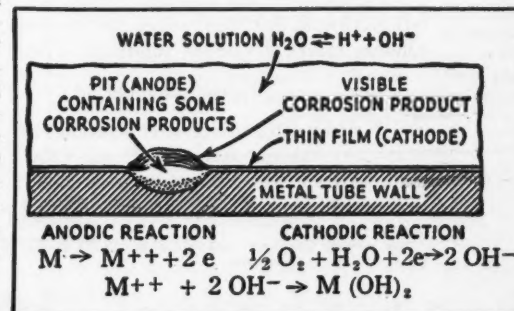
The localizing of the corrosion is due to the fact that differences in electrical potential exist between the various parts of the metal surface where localized corrosion is taking place. The corrosion is largely electrolytic.

There are available a number of mechanical and chemical means of dislodging or dissolving some of the corrosion products or deposits from condenser tubes. Some of the undesirable types of film should be removed from tubes at suitable periodic intervals before corrosion is initiated.

Bridgeport Technical Service

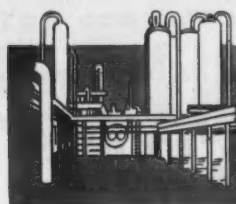
Bridgeport's Technical Service and Corrosion Laboratories have spent many years studying condenser and heat exchanger tube corrosion. Their knowledge and experience are available to help you solve your corrosion problems and to select the best alloy for your operating conditions. Your nearest Bridgeport Sales Office will be happy to put this service to work for you. Call it for more information and for your copy of Bridgeport's informative Condenser and Heat Exchanger Tube Handbook.

(1811)

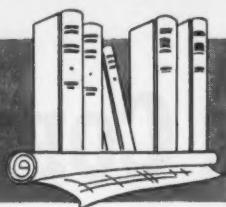


How localized pitting occurs under corrosion product or deposit by electrolytic reactions.

When inquiring check CP 4821 on handy form, pgs. 2-3



Processing and Engineering Data



106a

Determination of Pipe Thrust*

By Dr. ROBERT LOBSTEIN, M.E., Ch. E.

Consultant

Edited by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Design of complex piping systems for chemical plants nearly always involves determination of pipe thrust caused by thermal expansion of the pipe. Diameter of pipe changes only one factor important to thrust calculations: moment of inertia. Tables giving moment of inertia¹, thermal expansion^{2, 4, 5}, and modulus of elasticity⁶ are available. Using values taken from these sources and calculating sum of moment areas times distance of center of gravity from each neutral axis, one can find thrust directly with the simple expression

$$P = \frac{\Delta EI}{1728M}$$

where:

- P = thrust lb
 Δ = expansion of pipe between anchors in
 E = modulus of elasticity psi
 I = moment of inertia of pipe in⁴
 M = sum of moment areas times distance of center of gravity from each neutral axis cu ft

1728 is the conversion factor in³/ft³

Nomograph presented here and constructed by methods previously described³ solves this equation. Quick solution makes it easy to substitute several values.

Typical Example

A 12" diam extra strong steel schedule 40 pipeline is to carry exhaust steam at 175 psi (500°F). Distance between two anchored points is 20.2 ft. If sum of moments figures to 3290 cu ft and reference tem-

*This method has been copyrighted by Dr. Lobstein and is reproduced here by permission.

perature is 60°F, what thrust will be developed between these anchors?

Find modulus of elasticity for steel pipe as 29×10^6 psi. Correct this (modulus ratio table)⁶ by a factor 0.932 to allow for 500°F temperature. Actual modulus is then 27.3×10^6 . Expansion of pipe at 500°F (referred to 60°F) is found to be 3.8" per 100 feet of pipe or $(3.8 \times 20.2/100) = 0.768$ ". Moment of inertia for 12" diam steel XS schedule 40 pipe is found to be 361.5 in⁴.

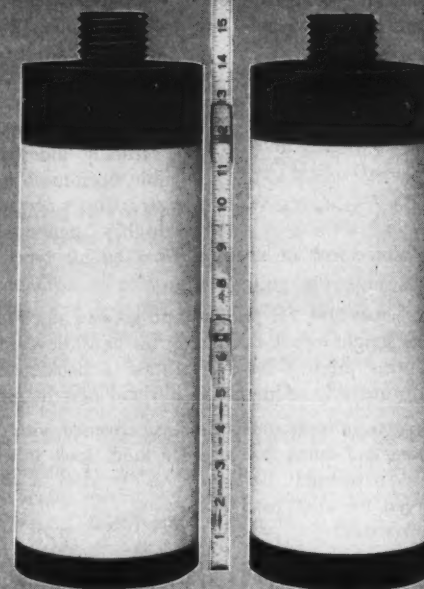
Connect 361.5 on moment of inertia scale with 3290 on sum of moments scale. Locate intersection on reference scale α . Connect this point with 0.768 on expansion scale. Locate intersection with reference scale β . Connect reference point with 27.3 on modulus scale and read pipe thrust as 1330 pounds.

(nomograph on page 163)

LITERATURE CITED

- (1) KENT, "Mechanical Engineers' Handbook," Fig 41, pp 5-61, (1946)
- (2) MITCHELL, C. T., "A Graphic Method for Determining Stresses in Pipelines," *Trans ASME, Fuel & Steam Power FSP-52-25*
- (3) DAVIS, D. S., "Empirical Equations and Nomography," Chapter V, New York, McGraw-Hill Book Co., Inc., (1943)
- (4) Crane Piping Catalog No. 49, p 531, The Crane Company
- (5) Tube-Turn Catalog No. 211, p 225, table 10, National Cylinder Gas Company
- (6) "Design of Piping System," M. W. Kellogg Company

SPECIAL Ceramic PARTS OUR SPECIALTY...



Porcelain Pistons produced by McDanel—service life of 5 years compared to less than one year for steel.

YOU SKETCH IT— WE'LL MAKE IT

Maybe you have considered a high strength, high temperature ceramic (porcelain) for a part but couldn't find a manufacturer to produce the part. That's McDanel's business—special ceramic parts with particular emphasis on oil field and ceramic applications, such as: pump cylinder liners; valve seats; flow chokes; pump plungers; gun nozzles; or perhaps a part never made before. Just sketch it and send along. Whether you need a special shape, special mix, special die or special body... McDanel can do.

Nothing can match ceramics in the proper application, for resistance to abrasion, corrosion, friction or high temperature.

Prompt response to your special inquiry.

McDANIEL
Industrial
PORCELAINS

McDANIEL
REFRACTORY
PORCELAIN
COMPANY
BEAVER FALLS, PENNA.

When inquiring check CP 4822 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Folders on three epoxy resins give properties, hardeners

Three technical bulletins, six pages each, give specific data on physical properties of C-8 epoxy resins BR-18774, BR-18795, and BR-18794. Physical, chemical, and electrical properties of recommended resin-hardener combinations are graphically presented. Included in each bulletin is a list of experienced compounders who are equipped to supply specially formulated compounds and lend technical assistance.

Buls No. 1, 2, and 3 on C-8 epoxy resins are issued by Bakelite Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N.Y. When inquiring specify CP 4823 on handy form, pages 2 and 3.

Pictures, describes components for electronic servomechanisms

Illustrated, 12-page brochure describes electronic computers and plug-in components. Positioning mechanisms, mach computers, master air data computers, accelerometers, and similar equipment are listed.

"Computers — Components — Control Systems" is available from Servomechanisms, Inc., Dept. CP, 316 Washington St., El Segundo, Calif. When inquiring specify CP 4824 on handy form, pages 2 and 3.

Focuses attention on steam cost and how to cut it

Booklet of sixteen pages helps focus attention on high-cost features of antiquated boiler equipment and advantages of modern automatic equipment. First part consists of drawings and captions emphasizing typical boiler plant problems.

"Have You Checked Your Steam Costs Lately?" is available from Orr & Sembower, Inc., Dept. CP, Morgantown Rd., Reading, Pa. When inquiring specify CP 4825, pages 2 & 3.

Describes flexibility tester for organic finishes

Laboratory tester for determining flexibility of organic finishes is described and illustrated in two-page leaflet. Test procedure and evaluation of results is also discussed.

Bul No. 153 is issued by Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. When inquiring specify CP 4826, pages 2 and 3.

Look closely into INCO's
latest casting development...

new Welding Grade Monel Castings weld like wrought Monel

Do you know that Inco is now producing *Welding Grade* Monel Castings on a commercial basis?

Field tests have demonstrated that these new Monel castings greatly simplify production welding of cast Monel parts. Now you can make build-ups, overlays, extensive metal-to-metal joints more easily and with greater assurance than ever before.

Not that standard Monel castings aren't weldable. They are. Many have been welded over the years and given good performance. Frequently a small amount of welding is done on Inco-Cast Monel with excellent results.

But in the heavier work, such as joining, you get even better results from the new *Welding Grade* castings. Take Fischer & Porter, for instance. Since they discovered *Welding Grade* Monel Castings, they have used them whenever corrosive service calls for the use of Monel in their Flowrator meters.

With *Welding Grade*, their customers get all the benefits of standard cast Monel, plus the extra advantage of strong joining welds . . . an important point, when, as with Flowrator meters, equipment handles corrosive fluids at 6000 (or more) psig.

To learn more about both standard and *Welding Grade* Monel, write for Inco's new booklet, "Cast to Outlast."

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.



Inco Castings . . . Sand, Centrifugal, Precision

When inquiring check CP 4827 on handy form, pgs. 2-3



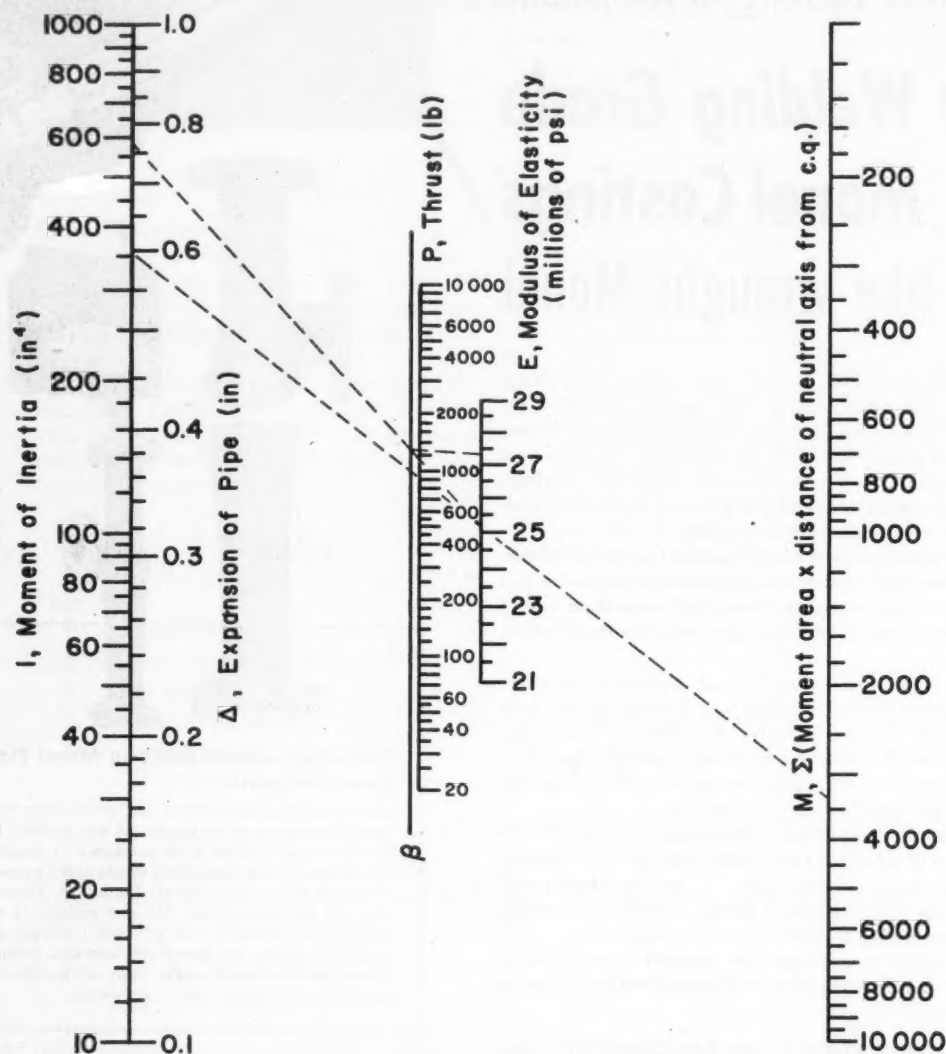
Production welded 600 psig Monel Flowrator meter and parts.

Armored Flowrator meters are made from these castings which have to be machined and welded together. They are used where high pressures or temperatures, liquid hammer or hazardous fluids make exposed glass metering tubes impractical. Fischer & Porter makes them of *Welding Grade* Monel Castings, in the type shown up to 600 psig (and in another design up to 6000 psig or higher) for handling fluorine, iodine, phosphoric and propionic acids, many of the chlorides and caustics, and certain other corrosives.

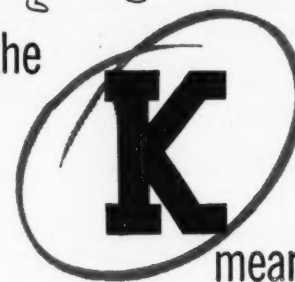


Determination of Pipe Thrust

(Continued from page 158)



what the



means to you

Just looking at a fitting, there are some things you can't see.

But when there's a "K" on the fitting, you can be sure there are no hidden defects. No thin walls and weak spots. No cold checks or sand holes. No porosity.

Of course, you can see the smoothness, the clean threading, the precise machining, the symmetry of a "K" fitting.

So the "K" on a fitting is your assurance of fine quality and careful workmanship.

It pays to get fittings from distributors who handle the "K" line.

THE KUHNS BROTHERS CO.
1808 McCALL STREET • DAYTON, OHIO

Stocks in Dayton, Ohio, Los Angeles, Oakland, Calif. and Branford, Conn.

When inquiring check CP 4828 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Exhaust
for heat

Steel
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Calif.

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acetylene

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Huds
quirin

**Exhausters are all steel
for heavy duty**

Steel plate exhausters for heavy-duty applications in handling air, gases, noxious fumes, dust, machine wastes, are described and pictured in 24-page bulletin. Housings of units described exceed gage requirements of FMA for minimum and recommended standards. Corrosion-resistant materials of construction are available. Bulletin also includes extensive tables of engineering design data.

Bul MX-104R is available from General Blower Co., Dept. CP, Morton Grove, Ill. When inquiring specify CP 4829 on handy form, pages 2 and 3.

**Interesting pictorial tour
of Sarnia, Ont., refinery**

Descriptions, photographs, and a flow diagram comprise 10-page article on Sun Oil Company's Sarnia, Ont., refinery. Other articles in 18-page publication cover Kansas City's water supply and increased capacity of a large Midwest gas and electric company.

"Alco Products Review", Summer 1954, is issued on letterhead request to American Locomotive Co., Dept. CP, 143 Erie Blvd., Schenectady 5, N.Y.

**Describes operation and uses
for dew point hygrometer**

Outstanding features and practical application of electronic dew point hygrometer is explained in four-page bulletin. Instrument measures dew point temperatures from -50°C to 18°C .

Bul on Model 900-1 is issued by Burton Mfg. Co., Dept. CP, 11201 W. Pico Blvd., Los Angeles 64, Calif. Specify CP 4830, pages 2 and 3.

**Chart lists high pressure
acetylene derivatives**

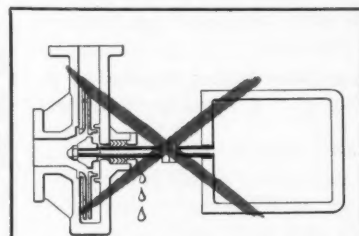
Structure, physical form, availability, and suggested uses of high pressure acetylene derivatives are summarized in tabular form folding notebook-size chart. Listed are alcohols, glycols, lactones, polyvinylpyrrolidone, alkyl vinyl ethers and esters and their polymers and copolymers, acetals, and other chemicals.

Bul M-104R is issued by Commercial Development Dept., General Aniline & Film Corp., 435 Hudson St., New York 14, N.Y. When inquiring specify CP 4831, pages 2 and 3.

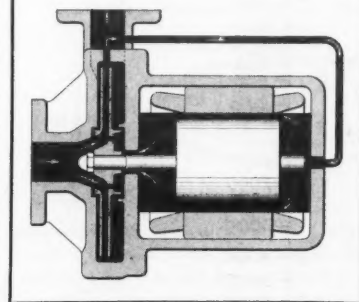
"CANNED ROTOR" PUMPS PAY OFF IN LOW UPKEEP COSTS, NO FLUID LOSSES

UNIQUE CHEMPUMP DESIGN SAVES TRICHLOROETHYLENE USER \$45 A DAY

Philadelphia, Pa. Officials of a large electrical switchgear manufacturer recently stated that \$45 per day savings of trichloroethylene resulted from installing a Model CF Chempump on a distillation-type degreaser. Fluid losses with the ordinary centrifugal previously installed averaged 25 gallons a day. "On top of this," they stated, "we had to repack the pump every two days. We'd tried all kinds of packing, some of them very expensive—but without luck. Since installing the Chempump, we haven't lost a drop of solvent, and there has been absolutely no maintenance."



Design secret of the Chempump lies in combined construction of pump and motor, which eliminates seals, stuffing boxes, lubrication, long external shafts, etc. The Chempump allows pumped fluid to enter rotor chamber; a corrosion resistant liner isolates stator windings. Chempumps are available in sizes from $\frac{1}{8}$ to $7\frac{1}{2}$ horsepower, and in a wide variety of construction materials.



NUCLEAR SERVICE REQUIREMENTS SPUR LEAK-PROOF PUMP PRODUCTION

Less than two years ago, only one company in the country was producing and marketing a canned-rotor pump. Today, spurred on by the atomic energy program, half a dozen firms are at work on models for atomic-powered submarines, nuclear energy central stations, even atomic-powered aircraft.

To the man in the chemical process industries, all this is good news, because canned-rotor pumps can't



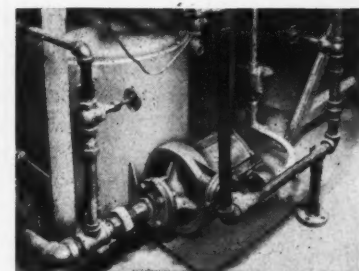
H. T. White and D. P. Litzenberg (left), developers of the first practical seal-less "canned-rotor" pump. On the desk are plans for an extreme-pressure, extreme-temperature design.

leak. They require no shaft seals or stuffing boxes, maintenance is practically nonexistent. And leakage losses, high maintenance costs are two of the biggest headaches centrifugal pump users face.

Canned-rotor pumps came about through the efforts of two young Philadelphia engineers, now officers and directors of the Chempump Corporation. Working on principles developed before World War II, they did further research and engineering, and in 1947 began production of a seal-less, canned-rotor pump.

Even while tooling up for production of this first model, the two designers were planning variations for specific applications in the chemical process industries. Pumps were built to handle extreme temperatures and pressures as well as a variety of corrosive fluids. The pumping requirements of chemical processors were carefully studied, and steps taken toward standardization of designs to meet those requirements.

1952 saw the formation of the Chempump Corporation to build canned pumps for the chemical process industries. Experience gained from nearly 15 years of laboratory and field testing went into the design and production of products offered by this corporation. First in the field of canned-rotor pumps, Chempump is also first with pumps tailored specifically to the chemical processing industry.



Chempump handling condensate under extreme vacuum for large Eastern chemical manufacturer. Air contamination would render system inoperative.

PUMP SERVICE POLICY ENDS MAINTENANCE PROBLEMS

To reduce process downtime, many plants purchase a spare pump for every two, three, or five pumps installed, depending on circumstances. We feel this is a good policy, since downtime is limited to the time required to install a spare.

But what about repairing the faulty pump? Are proper spare parts on hand? How about maintenance department scheduling? The answer to these and other problems is the Chempump Service Policy. Any Chempump, damaged or inoperative for any reason—including improper pump application—will be repaired at the factory and returned to the customer with a new pump warranty. The pump is completely rebuilt, inspected and tested by factory experts . . . and the cost is moderate.

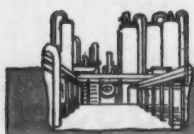
This service policy stops repair headaches, cuts spare parts inventory, and in effect, places a new pump on your shelves in short order.

Chempump

First
in the
Field

CHEMPUMP CORPORATION
1354 EAST MERMAID LANE • PHILADELPHIA 18, PA.

When inquiring check CP 4832 on handy form, pgs. 2-3



Preliminary Sizing of DUST COLLECTORS

By ROBERT W. RUPPERT

There are several factors to be considered in sizing dust collectors of the Hersey type (having blow rings about a filter cylinder). Among these are filter area, air rate, dust load, and several factors of secondary importance. Among these secondary factors are pressure differential, type of dust, blow ring speed and air rate.

Nomograph presented here considers only filter area, air rate, and dust load. It is based on studies where differential pressure was held low (about 3.5 inches of water) to assure long bag life. Blow ring air rate was 2.5 cfm per square foot of bag area and rings traveled at 30 fpm.

Under these conditions it has been found that

$$A = \frac{Q}{D^{0.848}} + 4.48$$

where:

A = wool felt filter bag area sq ft

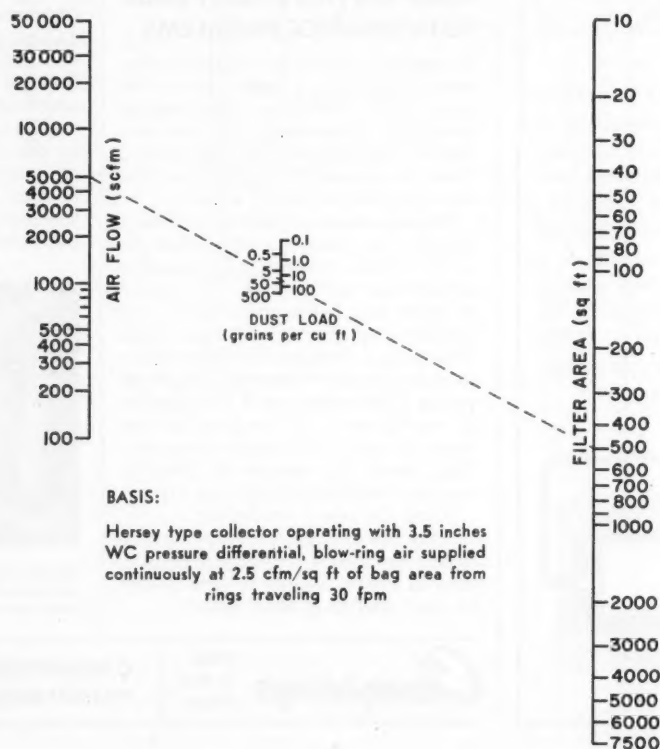
Q = air rate scfm
D = dust load of air grains/cu ft

This empirical equation give results which are average for many dry, finely-divided dusts when blow rings are able to hold cake to a constant thickness. In most cases it gives results on the conservative side. Exception to this is any dust which is moist, oily, or "smeary" — such dust will usually require more filter area. Coarse dusts, naturally, require less area. Results are to be taken as indicative. Manufacturer should be consulted for exact data.

Typical Example

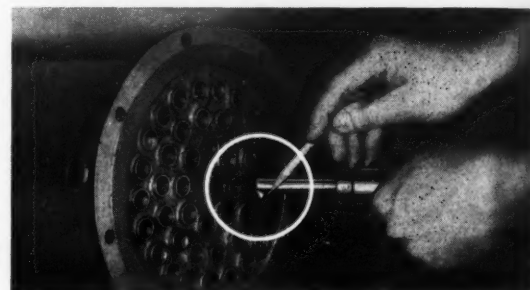
An air flow of 5000 scfm laden with 20 grains/cu ft will require what filter area?

Connect 5000 scfm and dust load of 20 grains/cu ft. Required area of 500 sq ft is found on Filter Area scale.



See what
WILSON's
done with the
**TUBE
CUTTER!**

This new Wilson Tube Cutter is making a big hit. Simple in design . . . very short . . . can be chucked into any electric or air drill . . . and the cutter bits are easily replaceable. Performance? Well, in a test on 3/4"-16 gage tubes, the average time was less than 3 seconds apiece, and the cuts were practically burrless. It's a fine tool . . . and reasonably priced, too.



New Wilson Tube Cutter is easy to use and does a fast job. Cutter sizes and shanks available to meet all heat exchanger requirements.



Tube Pilot helps pass tubes through baffles and far sheet when retubing.



Tube Knockout Tools for hand or mechanical use.

DON'T FORGET!
For faster, lower cost tube cleaning
WILSON TUBE CLEANERS
For easier, better rolling of tubes
WILSON TUBE EXPANDERS

Representatives in all principal cities

THOMAS C. WILSON, INC., 21-11 44th Ave., Long Island City 1, N.Y.
Cable Address: "Tubeclean" New York

WILSON
TUBE CLEANERS · TUBE EXPANDERS

When inquiring check CP 4833 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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and conv

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Gives US units of measure and conversion factors

Booklet lists US units of measure and conversion factors of units usually found in chemical engineering fields. Temperature conversion charts ($^{\circ}\text{C}$ vs $^{\circ}\text{F}$) are given, along with wire and sheet gage numbers, screw threads, drill sizes, and RTMA color code for resistors and condensers.

"Conversion Factors" booklet is available on letterhead request to New York Laboratory Supply Co., Inc., Dept. CP, 76 Varick St., New York 13, N.Y.

Presents data on the aging of loaded natural rubber

Digest-size bulletin presents data on the aging of Silene EF-loaded natural rubber stocks containing several typical age resisters. The six-page booklet contains recipes and physical properties of compounds containing no antioxidant and also those that do contain one of several typical antioxidants.

Silene Bul No. 3 is issued by Columbia-Southern Chemical Corp., Sub. of Pittsburgh Plate Glass Co., 420 Ft. Duquesne Blvd., Pittsburgh 22, Pa. Check CP 4834 on handy form, pages 2 and 3.

Compares soap consumption with nation's wealth

Relationship of soap consumption to a nation's source of wealth is explained in 30-page book. According to per capita statistics on soap sales, including synthetic detergents, the more highly industrialized countries show highest soap usage, while the basically agricultural countries show the lowest. Book includes statistics for 30 countries for 1950 and 1951.

"The Dynamics of the Soap Industry" is issued by Association of American Soap and Glycerine Producers, Inc., Dept. CP, 295 Madison Avenue, New York 17, New York. When inquiring specify CP 4835 on handy form, pages 2 and 3.

Emphasizes design features of cooling towers

Design characteristics and features of company's Cross-Flow cooling towers are described and illustrated in 32-page bulletin. Manufacturer of tower components is detailed.

Bul CF-54 is available from The Marley Company, Dept. CP, 222 W. Gregory Blvd., Kansas City 14, Mo. Specify CP 4836, pages 2 and 3.

for either of these
CHEMICAL PUMPING
needs . . . specify
ALDRICH

**AUTOMATICALLY
CONTROLLED
DELIVERY**

**MEDIUM to
HIGH PRESSURE
SERVICE**

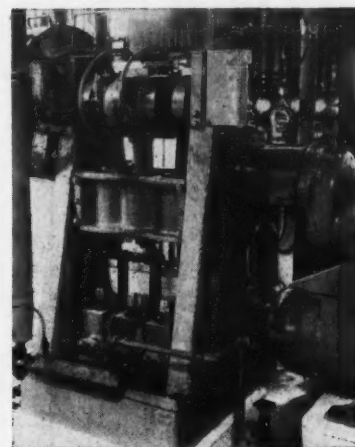
FOR AUTOMATICALLY CONTROLLED DELIVERY use an Aldrich-Groff "POWR-SAVR." This variable stroke triplex pump controls delivery from 0 to 100% of capacity at constant pump and motor speed . . . can be controlled from any remote point, manually or automatically. Power requirements are low, because consumption is directly proportional to demand.

"POWR-SAVR" pumps handle any free-flowing liquid at discharge pressures from 300 to 15,000 psi and are available in six sizes—from 2" to 6" stroke and from 5 to 125 bhp. For more information on these versatile pumps, write for Data Sheet 65.

FOR MEDIUM TO HIGH PRESSURE SERVICE several types of constant stroke pumps are available—depending upon the service involved. You may need the Inverted Vertical Triplex (Data Sheet 66), the Vertical Triplex (Data Sheet 26), or the Direct Flow Triplex or Multiplex Pump (Data Sheets 64, 64B). (All these helpful data sheets are available upon request.)

From our experience in building pumps for the chemical industry, we can—from our engineering and service files—frequently make specific recommendations to meet your chemical pumping needs. Whatever your problem, we welcome your inquiries.

Aldrich Pumps are ideal for applications involving corrosion, abrasive materials, high viscosity or high pressure. Among many liquids handled by Aldrich Pumps are: caustic solutions, fatty acids, nitric acid, acetic acid, aqua ammonia, anhydrous ammonia, as well as liquids encountered in the petroleum refining, petroleum chemical, and other industries.



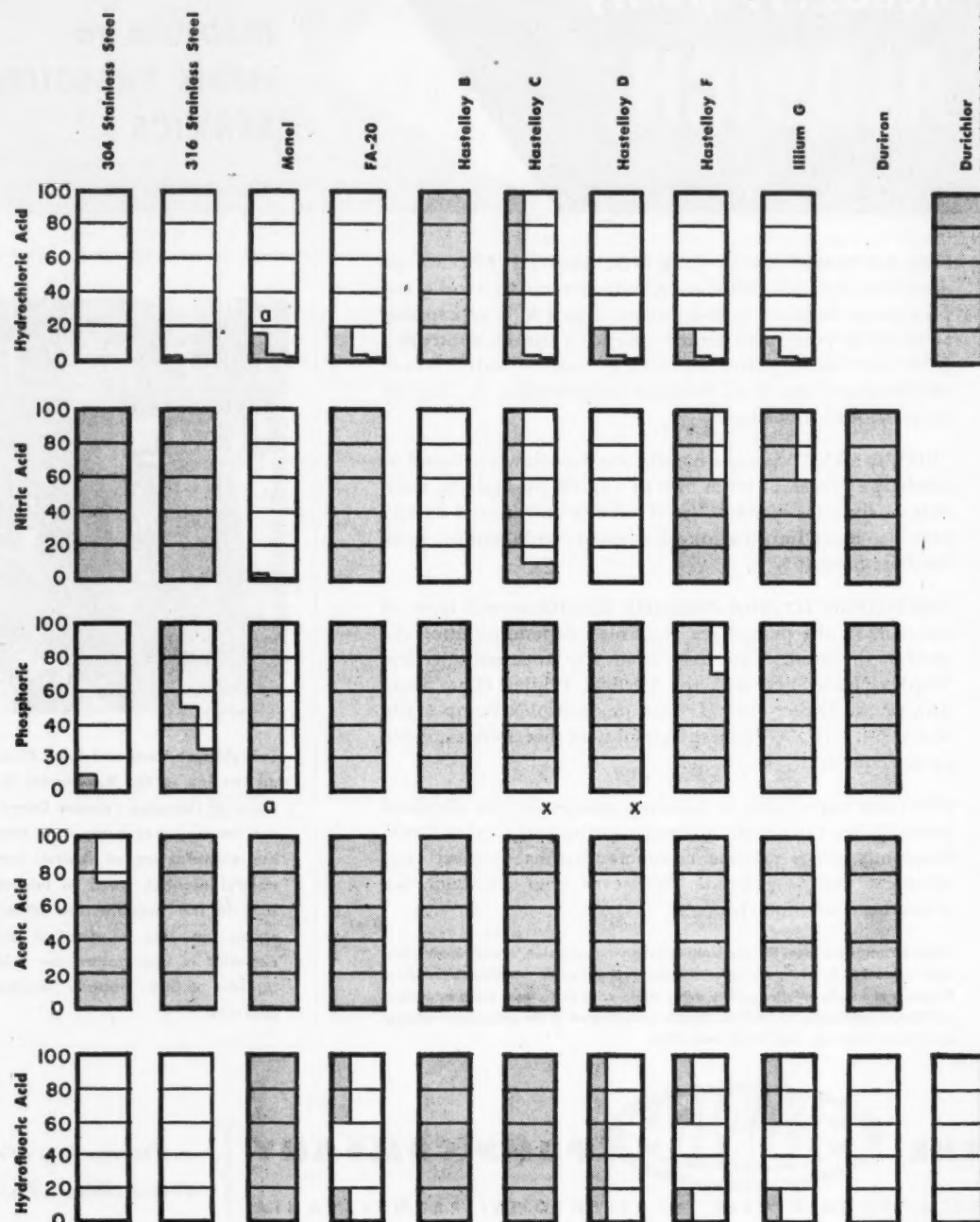
This Aldrich Vertical Triplex Pump—on the job at the Burlington, N. J., plant of Hercules Powder Company—is employed to pump rosin ester in the manufacture of Abitol, hydroabietyl alcohol, used in lubricants and in the manufacture of alkyl resins. In this application pump capacity is one gallon per minute against 6,000 pounds discharge pressure.

THE ALDRICH PUMP COMPANY } ...Originators of the
23 GORDON STREET • ALLENTOWN, PENNSYLVANIA } *Direct Flow Pump*

Representatives: Birmingham • Bradford, Pa. • Boston • Buffalo • Carmi, Illinois • Charleston, W. Va. • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Duluth • Houston • Los Angeles • New York • Oakland, Calif. • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • Rochester • Salt Lake City • San Francisco • Seattle • Somerville, Mass. • Spokane, Wash. • Syracuse • Tulsa • Washington, D. C. • Youngstown • Export: Petroleum Machinery Corp., 30 Rockefeller Plaza, New York 20, N. Y.

When inquiring check CP 4837 on handy form, pgs. 2-3

CORROSION KEYS: Alloys



NOTES: a — when air free
x — in technical acid, only below 70% in chemically pure acid

"Corrosion Keys" are copyrighted (1954) by Putman Publishing Company

IMPORTANT CORRECTION

These Corrosion Keys were erroneously labeled in December CHEMICAL PROCESSING. This reprint, with labels correctly relocated, should be used to replace earlier data sheet.

Many thanks to sharp-eyed readers who helped us spot this printer's error.

104b

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DO 2-0375

When inquiring check CP 4838 on handy form, pgs. 2-3

SPRACO NOZZLES

Write for NOZZLE CATALOG to
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125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 4839 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Heavy-duty centrifugal pumps give continuous service

Heavy-duty line of saddle-mounted, vertically-split centrifugal pumps designed for continuous duty in all boiler circulation and heater drain services is described in 8-page bulletin. Materials of construction, coverages available, pressure-temperature limitations, dimensions and specifications, and cross-section drawings are presented.

Bul W-341-B11B is available from Worthington Corp., Dept. CP, Harrison & Worthington Aves., Harrison, N.J. Check CP 4840, pages 2 and 3.

Aids in selecting microscopes and accessories for labs

Uses, performance data, and specifications on more than 60 microscope models and accessories are outlined in 28-page brochure. Manufacturer's line includes both monocular and binocular microscopes with straight or inclined tubes. Cases, stage lights, and other accessories are pictured and described.

Cat D-185 is issued by Bausch & Lomb Optical Co., Dept. CP, 635 St. Paul St., Rochester 2, N. Y. Specify CP 4841 on form, pages 2 and 3.

Shows role of chloral as reactant and gives extensive references

Monograph of 26 pages lists reactions of chloral with organic, organometallic, and inorganic compounds. Eight-page bibliography includes 294 references to U.S. and foreign literature and patents. Properties, shipping information, and toxicity data are also presented.

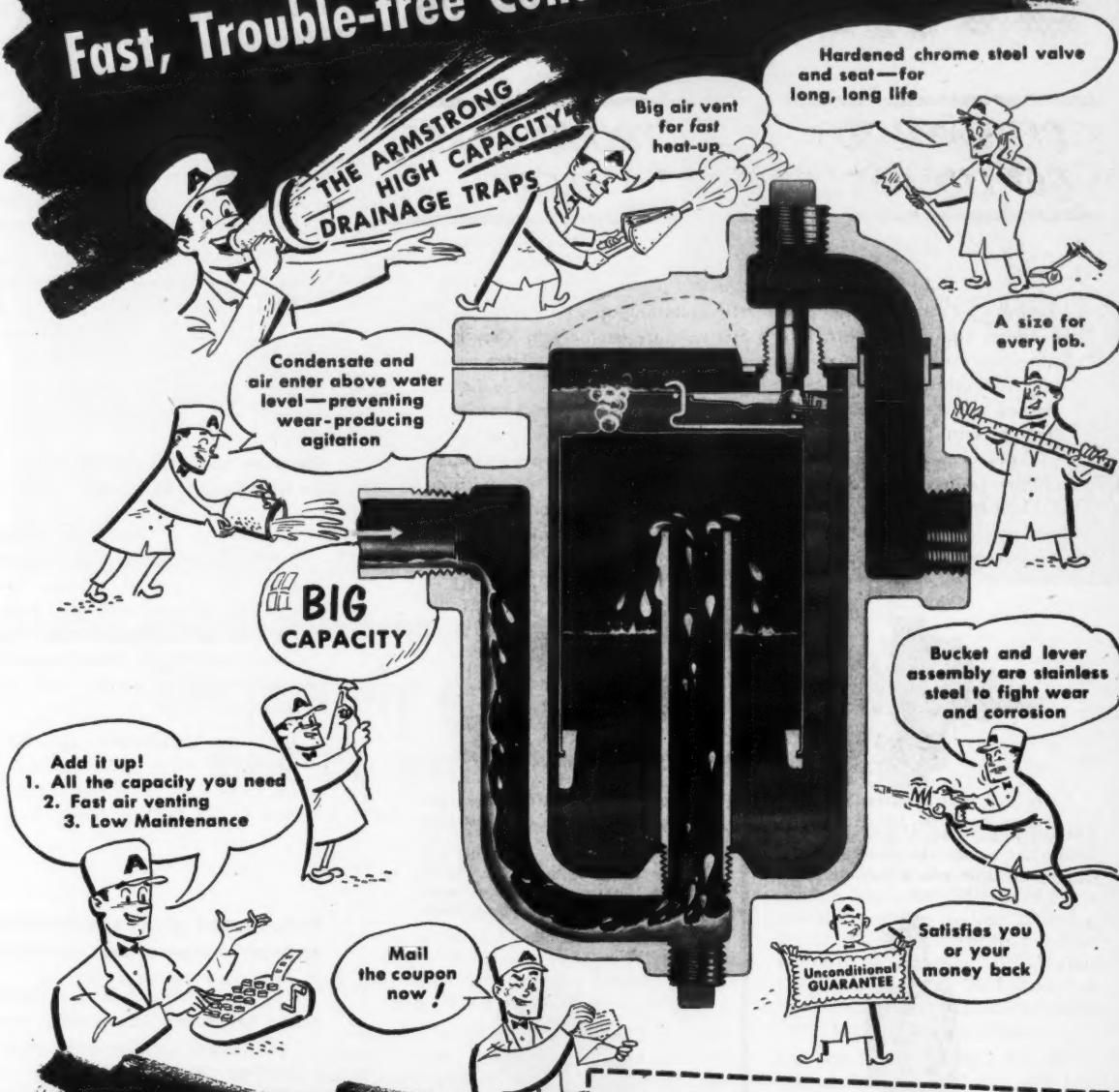
"Chloral" (Bul No. 206) is issued by Westvaco Chemical Div., Food Machinery & Chemical Corp., Dept. CP, 161 E. 42nd St., New York 17, N.Y. Specify CP 4842 on handy form, pages 2 & 3.

Gives 1953 accident rate of chemical companies

Accident frequency and severity rates for the chemical and rubber industries are presented in 36-page pamphlet. Injury rates for 1953 as well as for a three-year average (1951-53) are shown in table form.

"Chemical and Rubber Accident Rates" for 1953 are issued by National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. Specify CP 4843, pages 2 and 3.

here is the means for Fast, Trouble-free Condensate Drainage



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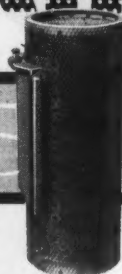
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When inquiring check CP 4844 on handy form, pgs. 2-3

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DESIGNED TO
GET LIQUIDS...

"TROUBLE-FREE"
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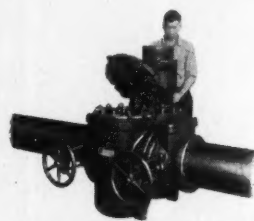
THERE'S NO CHANCE of foreign matter gumming-up your costly liquid-handling equipment when Elliott Strainers are on the job. They have proven an excellent method of removing objectionable solids from water, fuel and lubricating oil, gasoline, and in fact any strainable liquid. Backed by over fifty years of Elliott design and construction experience, these present-day strainers are servicing thousands of power and industrial plants everywhere. The line offers a great variety of types including Single, Twin and Self-Cleaning Strainers, covering pipe sizes with an I. D. of from 1" to 24". For detailed information on any or all of these strainers, call your local Elliott Field Engineer or write Elliott Company, Accessories Dept., Jeannette, Pa.



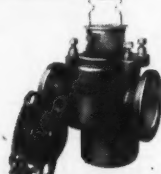
TYPE "W" TWIN STRAINER—Specially designed for lube oil, fuel oil and viscous liquids. Available sizes 1" to 8" for 125, and 1½" to 10" for 300 and 500 psi. Straining baskets available with 1/64" to 3/16" mesh.



TYPE "K" SELF-CLEANING STRAINER—For removing large amounts of dirt and foreign matter in water only. Available sizes 4" to 24" for pressures from 25 to 125 psi. Straining units available with 1/32" to ¾" mesh. Can be furnished with AC or DC motor. The power requirement does not exceed ½ hp., in the largest size.



TYPE "A" TWIN STRAINER—For water and other liquids . . . available sizes 4" to 24" for 125 psi—4" to 12" for 250 psi. Straining baskets available with 1/32" to ¾" mesh. The twin strainer design, with one chamber always available for service, assures clear liquids on a continuous basis.



TYPE "F" SINGLE STRAINER—For use where the flow does not contain large quantities of foreign matter, and where the strainer can be temporarily out of service for cleaning. Available in sizes from 2" to 24". Baskets available with 1/32" to ¾" mesh. Has a single perforated basket, convenient to handle and quickly accessible.

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STEAM TURBINES • MOTORS • GENERATORS • DECARBONIZING HEATERS • EXTRACTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 4845 on handy form, pgs. 2-3

NEW LITERATURE

Flash points of 2400 liquids indexed by their trade names

Flash points of over 2400 flammable liquid trade name products have been compiled and published by the National Fire Protection Association.

The 82-page booklet is aimed at assisting safe storage and use of flammable liquids. Previously, the NFPA has published tabulation of fire hazard properties of flammable liquids identified only by their chemical names.

In addition to flash points, the index identifies each product as to its principal uses, manufacturer, and NFPA's source of information about it.

NFPA booklet is available upon remittance of \$1.25 to National Fire Protection Association, Dept. CP, 60 Batterymarch St., Boston 10, Mass. . . . or for more information check 4846 on handy form, pages 2 and 3.

German and Russian patents on inorganic chemicals

Translations of patent applications and research reports from German and Russian are available. Loose-leaf index to bulletins, giving a digest and cost information, is divided into six sections: sulfur and sulfur compounds, silicon compounds, "per-" compounds, phosphorus compounds, metals and metal compounds, and miscellaneous compounds.

Index to translations, Bul No. 88 "Inorganic Chemicals" is issued by Research Information Service, Dept. CP, 53 Nassau St., New York 38, N.Y. Specify CP 4847 on handy form, pages 2 and 3.

Pictures and gives specifications on environmental test chambers

Line of environmental test chambers is described and illustrated in 12-page, two-color bulletin. Bulletin gives specifications on high and low temperature chambers, humidity chambers, walk-in altitude chambers, cloud and pour chambers, and testing chambers for explosion, fungus, sand and dust conditions.

Last three pages of bulletin are tables for determining relative humidity with wet and dry bulb thermometers, weight and specific heat of various materials, standard atmosphere data, and temperature conversion tables (Centigrade and Fahrenheit).

Bul No. 754 is issued by Bowser Technical Refrigeration Co., div., of Bowser, Inc., Dept. CP, Terryville, Conn. When inquiring specify CP 4848 on handy form, pages 2 and 3.



Lined Gage shown with lined blind cover flanges.

WHERE concentration of liquids such as sulphuric, muriatic or other acids necessitates equipment with special linings, Jerguson can furnish you with reflex or transparent gages lined with natural and synthetic rubbers, lead, phenolic base compounds, Teflon, and other materials. Jerguson Lined Gages are designed to meet your requirements of long-life and dependable operation.

To meet your constantly increasing variety of demands, Jerguson engineers, working closely with the men in the Chemical and Petrochemical Fields, have developed a complete line of sound, dependable liquid level gages, valves, and specialties in various metals and synthetics to handle corrosive liquids and gases.

Jerguson Gages keep you out of trouble, and they save you time and money. Send for drawing GD-431 on Lined Gages, or send your requirements.



When inquiring check CP 4849 on handy form, pgs 2-3.

CHEMICAL PROCESSING

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Technical reference explains servomechanism system

Technical reference of four pages pictures and describes servomechanism systems. In addition to describing the construction features and listing operating characteristics of the system, technical reference includes photographs and engineering drawings of key parts. It also contains a diagrammatic layout showing how parts are hooked up.

Tech Ref 54B is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. Specify CP 4850, pages 2 and 3.

Presents technical data on light-stable plastic

Technical data bulletin on light-stable polystyrene plastic for the lighting field includes information on properties, fabrication considerations, finishing, and suggested uses. Recently-developed material described is said to have eight to ten times better light-stability than general purpose polystyrene.

Bul on Styron 647 is available from Plastic Sales Department, The Dow Chemical Company, 1000 Main St., Midland, Michigan. When inquiring specify 4851 on handy form, pages 2 and 3.

Applications and specifications of gas regulating valves

High-pressure and corrosion-resistant gas regulating valves are described and illustrated in 16-page bulletin. Flow curves, diagrams, and drawings illustrate operation and features of units discussed. These regulators can control liquids as well as gas.

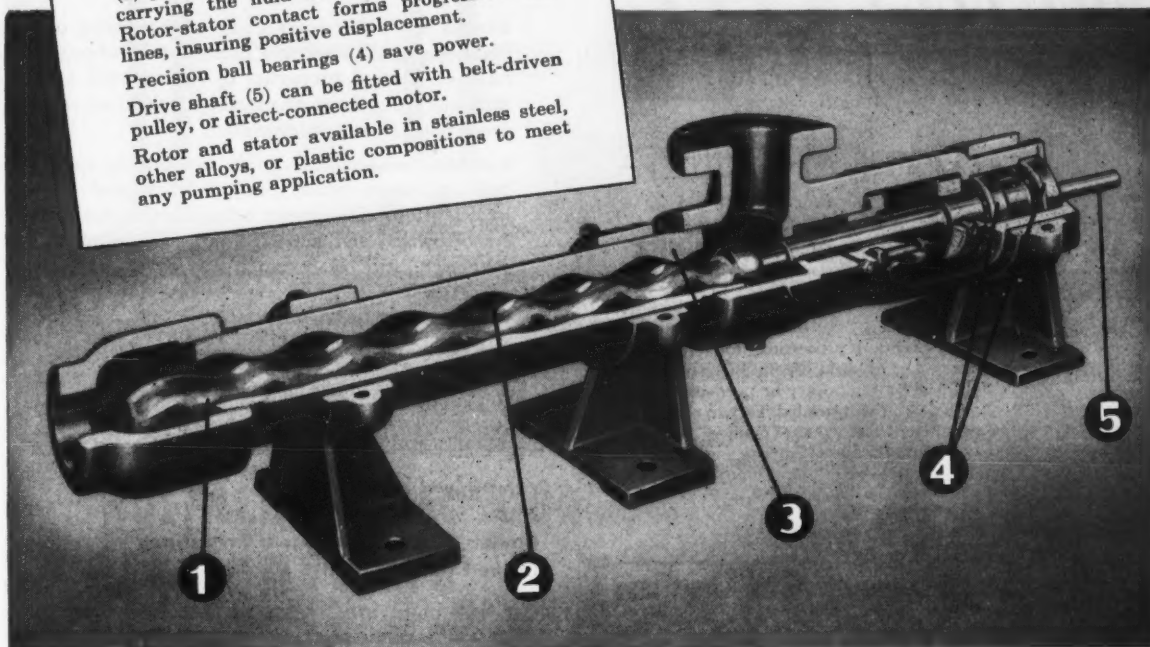
Bul 341 is available from Welding Equipment Div., Victor Equipment Co., Dept. CP, 844-54 Folsom St., San Francisco 7, Calif. When inquiring specify CP 4852, pages 2 and 3.

Gives data and design features on multiple stage flowmeters

Technical information on multiple stage flowmeters is presented in two-page bulletin. Complete specifications including major construction features and maximum flow ranges are provided.

Bul 1053 is issued by Commercial Research Labs, Inc., Dept. CP, 20 Bartlett Ave., Detroit 3, Mich. Specify CP 4853, pages 2 and 3.

How it works: as the rotor (1) turns, cavities (2) progress toward the end of the stator (3), carrying the fluid or semi-solid with them. Rotor-stator contact forms progressive seal lines, insuring positive displacement. Precision ball bearings (4) save power. Drive shaft (5) can be fitted with belt-driven pulley, or direct-connected motor. Rotor and stator available in stainless steel, other alloys, or plastic compositions to meet any pumping application.



If your pump requirements are a little different...

The entirely different MOYNO® Pump may be exactly what you need!

You name the problem! Are your pumped materials viscous, semi-solid, hard to move? Do they tend to disintegrate? Are they abrasive? Do pump maintenance costs seem high? If "yes" is the answer to any of these, find out why Moyno Pumps handle jobs where other pumps fail!

The Moyno is different! The cut-away view above—and the facts listed at left—describe a completely new concept of pump design. They show why the Moyno is a pump you can specify, install and forget.

Will it solve your problem? Chances are it will... at least there isn't a more versatile pump made! Moynos pump clay for a leading pottery maker. They're being used for handling white water in paper mills... for caustics... an Eastern food producer is even using them successfully for pumping potato salad!

Get more facts today! An interesting, factual bulletin will tell you more about the simple, versatile Moyno Pump. Write for your free copy of Bulletin 30-CP

FACTS ABOUT THE MOYNO the world's simplest pump

- **Positive Displacement**—Moynos are available to pull up to 29 inches of vacuum while discharging under pressure. Big Moynos can deliver up to 250 gallons per minute, against pressures up to 600 p.s.i.
- **Gentle**—no churning, foaming; won't break up semi-solids.
- **Reversible**—pumps with equal efficiency in either direction.
- **Trouble-Free**—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service, easy to maintain.
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Moyno
Pumps

Propellor Industrial
Ventilating Equipment

When inquiring check CP 4854 on handy form, pgs. 2-3

ACE-FLEX®



... new **ALL-PURPOSE**
flexible
plastic tubing

Excellent chemical resistance. Clear, odorless, non-toxic, suitable for chemical processing, food products, medical use, machine hose, etc., ... wherever a temporary or permanent fluid line or hose is needed. Easy to clean, can be steam-sterilized. All sizes from 1/8" to 1" ID. Write for technical data and prices ... free bulletin 66 CF.

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processing equipment • SINCE 1852

AMERICAN HARD RUBBER COMPANY, 93 Worth St., New York 13, N. Y.

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SOLVENTS NOW AVAILABLE FOR 2c PER GALLON

Many industrial solvents, worth more than 50c per gallon, can be recovered for re-use at a cost of only 2c per gallon. That is direct operating cost per gallon of a Barnebey-Cheney solvent recovery system. This savings potential will pay for a Barnebey-Cheney recovery system in a short time. In addition, objectionable odors no longer contaminate work areas, nor are they allowed to spread throughout the neighborhood.

If your business uses volatile solvents, you'll be dollars ahead with a Barnebey-Cheney recovery system. Wire, write or call for full information, there's no obligation.

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In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 4856 on handy form, pgs. 2-3

NEW LITERATURE

Dyeing of cyanoethylated cotton reviewed in bulletin

Results of a preliminary study on the dyeing of cyanoethylated cotton are presented in 14-page bulletin. Dyeing properties of the material are different from those of untreated cotton or any other natural or synthetic fiber.

Complete with tables, charts, and photographs, bulletin covers penetration, stability, and exhaustion tests. Dyeometer exhaustion curves for cyanoethylated and untreated yarns are included. Although still in exploratory stage, dyeing processes which gave good results in laboratory are described in appendix.

Bul 837 is issued by Dyestuff Department, American Cyanamid Company, Dept. CP, Bound Brook, New Jersey. When inquiring specify 4857 on handy form, pages 2 and 3.

Covers 1350 Government inventions in the chemical field

Containing 1350 abstracts of government-owned inventions in the chemical field, 106-page book is designed to encourage industry to take advantage of Government-sponsored research. Inventions are ordinarily available to public on royalty-free license basis.

To aid readers in locating items of particular interest to their own operations, the abstracts are grouped under 19 industrial classifications. Listing includes brief description of invention, title and number of patent, name of inventor, and the Government agency administering patent. Also listed in book are addresses of field offices of US Department of Commerce and of the Small Business Administration.

Classifications listed are plastics; natural and synthetic rubber; synthetic fibers; cleaning and polishing preparations; glue, gelatin, and adhesives; paints, varnishes, inks, and pigments; drugs and medicines; insecticides, fungicides, and rodenticides; fats and oils; wood products and processes; water treatment processes; petroleum products and processes; coal products and processes; intermediates, dyes, and toners; explosives; fertilizers; gas products and processes; miscellaneous organic and inorganic products and processes.

The volume is one in series of seven books of patent abstracts prepared by the Government Patents Board.

To obtain Patent Abstract Series, No. 2, "Chemical Products and Processes," PB 111465, remit \$3.00 direct to Office of Technical Services, United States Department of Commerce, Washington 25, D. C.

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Developed especially for the efficient handling of high temperature and highly volatile liquids. Delivers outstanding performance. Unbeatable on high head, small capacity duties.

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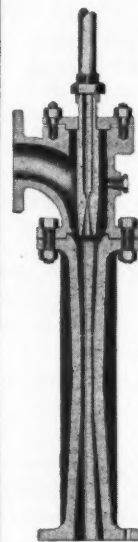
AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY

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Solve it with a simple,
economical I-R EJECTOR



It's surprising how many vacuum problems can be solved by I-R steam-jet ejectors. Often these simple, economical devices can utilize steam that would otherwise be wasted, thus saving the cost of more elaborate vacuum equipment.

Your nearest Ingersoll-Rand branch office or representative will be glad to help you determine the size and construction best suited to your operating conditions. Write us for Bulletin 9013-A.

4-135

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PUMPS • COMPRESSORS • TURBO-BLOWERS • VACUUM EQUIPMENT
AIR & ELECTRIC TOOLS • GAS & DIESEL ENGINES

When inquiring check CP 4859 on handy form, pgs. 2-3

CHEMICAL PROCESSING

INDUSTRIAL RELATIONS

(Continued from page 7)

represents one-third of the supply.

Petroleum toluene production is double that available from coal tar. It also is cheaper to produce than petroleum benzene. Chemical companies, recognizing the reversal in the classical price relationships between benzene and toluene, are beginning to build a significant chemical industry on toluene. The new polyvinyltoluene plastics and the isocyanate foam rubbers are typical examples.

Petroleum xylene capacity is more than ten times that of coal tar producers and, for the first time, xylenes are available for large-scale chemical synthesis. Para-xylene for Dacron, ortho-xylene for phthalic anhydride, and meta-xylene for isophthalic acid are all in commercial production. Ethyl benzene, a by-product of xylene separations, can be used as a raw material for styrene.

It is useless to speculate when production of petrochemicals may exceed conventional petroleum products, but only a few decades may pass before petrochemicals have the greater dollar value.

Are you wondering why many of these editorial articles give . . .

Manufacturer's Name and Address . . . ?

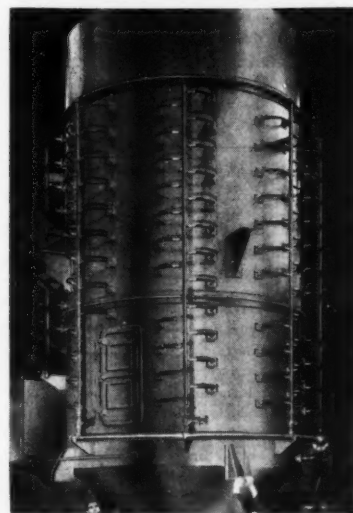
You doubtless have noted names and addresses of manufacturers at the end of editorial articles in CHEMICAL PROCESSING. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

We know that many readers often want more than just the pertinent description and facts . . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

This is one of our extra Reader Services, pioneered in this field by CHEMICAL PROCESSING in 1938.

THE EDITORS



"Buffalo" Hydraulic Scrubbing Tower



VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

"BUFFALO" CURED OUR CHIMNEYS OF A STUBBORN SMOKING HABIT!



"We were stumped with a problem of coke breeze discharge. Even after cyclone separation, it was heavily loaded — thick and black. To make matters worse, the contaminant was too abrasive and hot for ordinary equipment to handle! Then we talked to a "Buffalo" engineer. He recommended a unit "Buffalo" just recently developed — a Hydraulic Scrubbing Tower. It cleans by wet centrifugal scrubbing. The effects of heat and severe abrasion are overcome. It doesn't clog — needs very little attention. And its collection efficiency is so high that our stack discharge is harmless and almost colorless. When you consider the improved 'neighbor relations' and the simplicity and economy of operation, our "Buffalo" Hydraulic Scrubbing Towers have paid for themselves many times over."

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"Buffalo" units and "Buffalo" experience cover the entire range of today's specialized air cleaning applications. Why not call on these facilities for the best results on *your* problem — for the famous "Q" Factor* Performance that plants everywhere are enjoying.

**The "Q" Factor — The built-in Quality which provides trouble-free satisfaction and long life.*

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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When inquiring check CP 4860 on handy form, pgs. 2-3

**Pump liquids gases,
solids in solution**



**Just place connecting
tubes in**

**NEW,
large
Sigmamotor
Pump!**

• Wavelike
action of steel
fingers forces
liquid through the

tubing. Material in tubing never touches pump.
Stops contamination and corrosion.
Excellent for handling of corrosive
solution.....

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Smaller unit with capacities to 30
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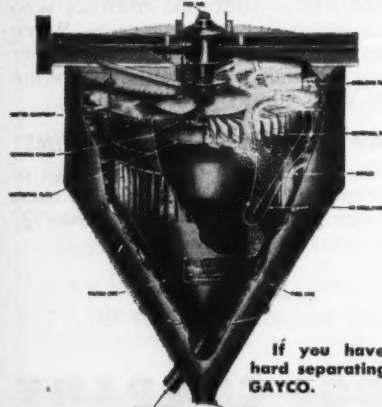
18 North Main Street • Middleport, N. Y.

When inquiring check CP 4861 on handy form, pgs. 2-3

GAYCO CENTRIFUGAL SEPARATORS.

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED"
GAYCO brings you all these:



Range 60
to 400 mesh

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capacity

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Slow speed for
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PROCESSES, EQUIPMENT and MATERIALS



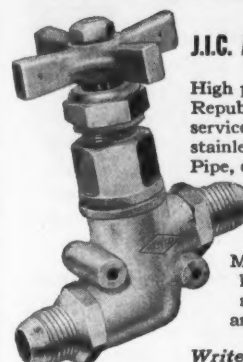
Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contains the proper manufacturers for you—information comes to you direct.

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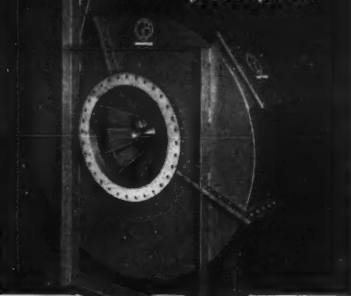
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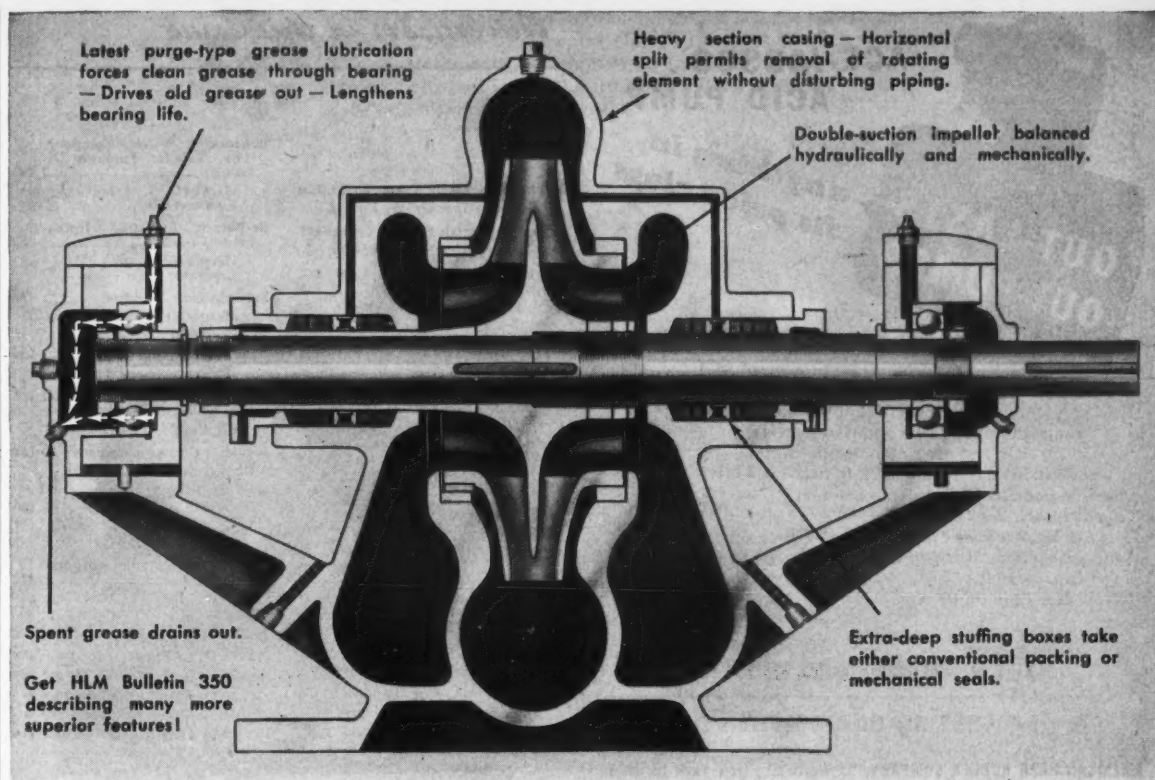
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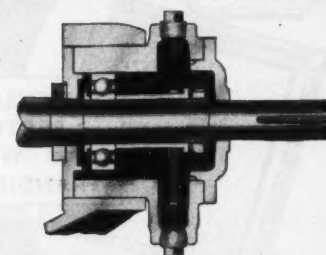
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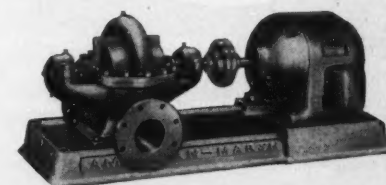


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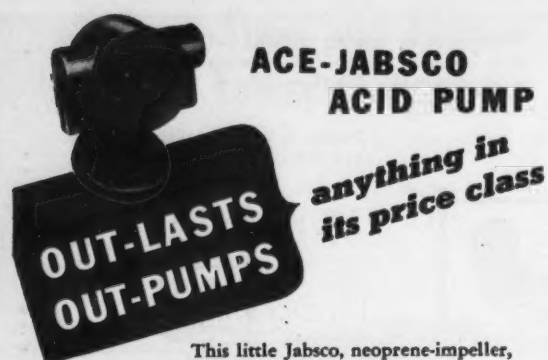


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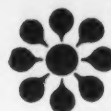
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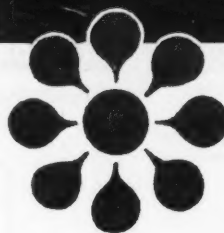
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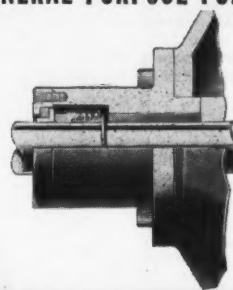
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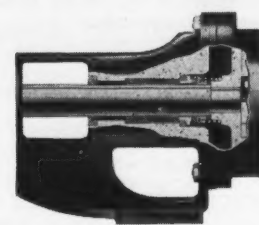
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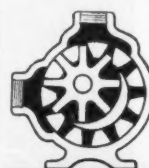


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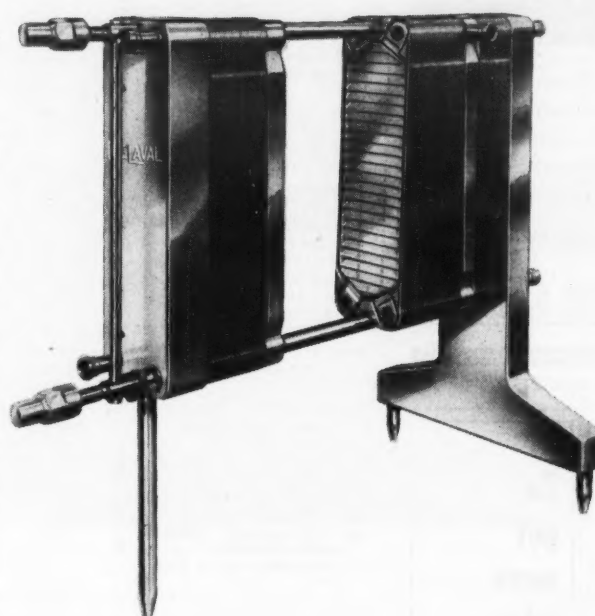
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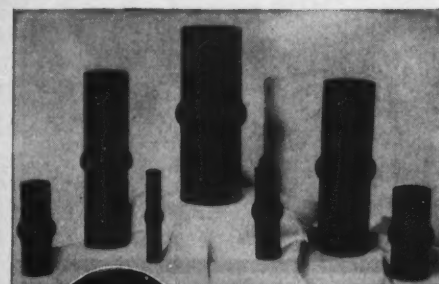


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*TEFLON

SHEET, ROD, TUBE, SPRAY COATING,
PRECISION MOLDED AND MACHINED PARTS
made by
FLEXROCK COMPANY
PHILADELPHIA 1, PA.
BARING 2-5500

*DuPont's trademark for tetrafluorethylene resin

When inquiring check CP 4881 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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Edible soc

Experiments made from soap and dishes, and drink. This industry experience of byproducts a

Chemical four train

According Railroads, enough tank chemicals a four freight Carloadings 2,305,488, 6300 cars light is the back to 183 car was used

Water re but man

Assuming holds a gal pare that to average of water falls tation. Aro this returns oration or remainder billion gal only about 186 billion

For more uct at r . . . se blank be

THAT'S
INTERESTING



Edible soap?

Experiments under way on a detergent made from sugar may be indicative that the day is coming when infants can eat soap and adults can wash clothing, dishes, and hair in suds they can safely drink. This is one of many surochemistry experiments investigating the feasibility of products with sugar or its byproducts as starting materials.

Chemicals help load four trains an hour

According to the Assn. of American Railroads, during every hour of 1953 enough tank cars were loaded with chemicals and petroleum to make up four freight trains of 66 cars each. Carloadings for the year totaled 2,305,488, or an average of more than 6300 cars a day. An interesting sidelight is that the tank car idea dates back to 1835, and the first commercial car was used in 1865.

Water resources abound, but management needed

Assuming the washbasin in your home holds a gallon of water or more, compare that to these figures. Each day an average of 4300 billion gallons of water falls on our country as precipitation. Around 3000 billion gallons of this returns to the atmosphere by evaporation or is used by vegetation. The remainder is run-off — about 1300 billion gallons. We capture and use only about 1/7 of this . . . or about 186 billion gallons.

For more information on product at right, specify CP 4882 . . . see information request blank between pages 2 - 3.

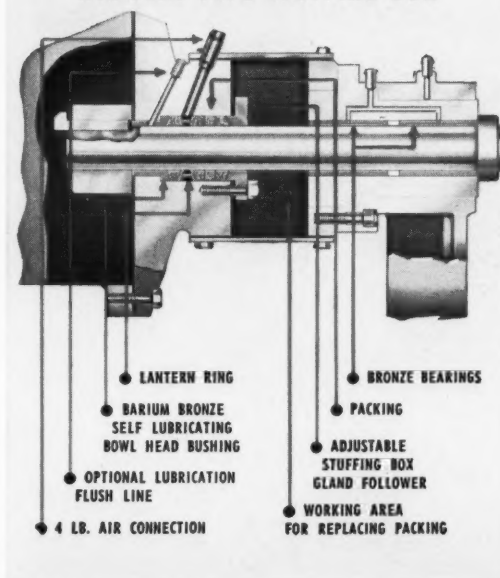
DAY

means longer life span



DAY Imperial Mixer
installed at
Woodall Industries,
Detroit, Mich.

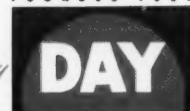
AIR SEAL TYPE STUFFING BOX



* Built for heavy duty, engineered for precision . . . this combination makes DAY's Imperial Mixer extra long-lasting and serviceable. It has been re-engineered with major advances in design, assuring fast, thorough dispersion mixing of heavy plastics and colors in paints and inks, as well as sludge reclamation in paints and enamels.

Shown at left is one of the Imperial Mixer's most valuable features . . . the Air Seal Type Stuffing Box. Pneumatic pressure at 4-10 lbs. protects your product against contamination by lubricants and guards bearings from damage by abrasive mixtures. CO₂ may be substituted for air. For details, call your nearest J. H. Day field engineer or write for Bulletin 600.

FOUNDED 1887



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you buy dependability

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Resins

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Modified Coumarone-Indene
Styrenated
Alkylated Phenol
Oxidizing
Petroleum
Resin Solutions

Solvents

Nevsolv
Hi-Flash
Cosol
Wire Enamel
Crude
Benzol
Toluol
Xylol

Plasticizing Oils

Neutral Oils

Rubber Reclaiming Oils

Tar Acid Oils

Phenothiazine

Shingle Stain Oils

Crude Naphthalene

Neville Warehouses

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Boston (Medford), Massachusetts
Houston, Texas
Los Angeles, California
Montreal, Canada
Philadelphia, Pennsylvania
San Francisco, California
South Kearny, New Jersey
Toronto, Canada

...when you buy
Neville Chemicals
you buy protection



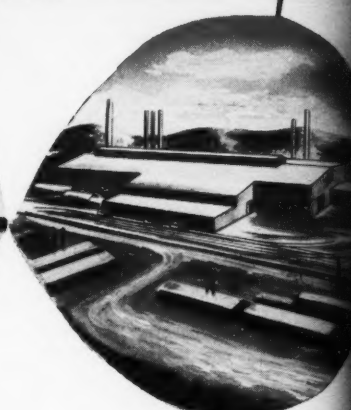
In the Home

Mastic floor tile now lasts longer and is made better due to Neville Resins. Common household items, like drain mats and bathroom mats, molded rubber products, even phonograph records, are far more durable, thanks to the use of Neville Resins. And rubber wire insulation, manufactured with these modern resins, protect the home.



On the farm

Neville Phenothiazine, used in proprietary medicines, protects cattle against disease. Neville Aromatic Solvents, used in making Insecticides and Herbicides, protect farm crops, and Neville Resins insure citrus preservation. Neville Resins also are used to make aluminum paints for farm buildings and Neville Shingle Stain Oils preserve wood surfaces.



In Industry

Coatings made from Neville Resins and Solvents protect valuable equipment, buildings and finished products from corrosion. Adhesives, floor tiles, foundry core oils, insulation compounds and rubber products—all do their job better because of Neville Resins.

◆Yes, when you buy Neville Chemicals, you buy protection . . . protection against the elements, against wear and tear, even against cattle and crop diseases . . . protection that comes from years of experience and research in this field.

NEVILLE CHEMICAL CO.

PITTSBURGH 25, PA.

NEVILLE

Plants at Neville Island, Pa., and Anaheim, Cal.

When inquiring check CP 4883 on handy form, pgs. 2-3